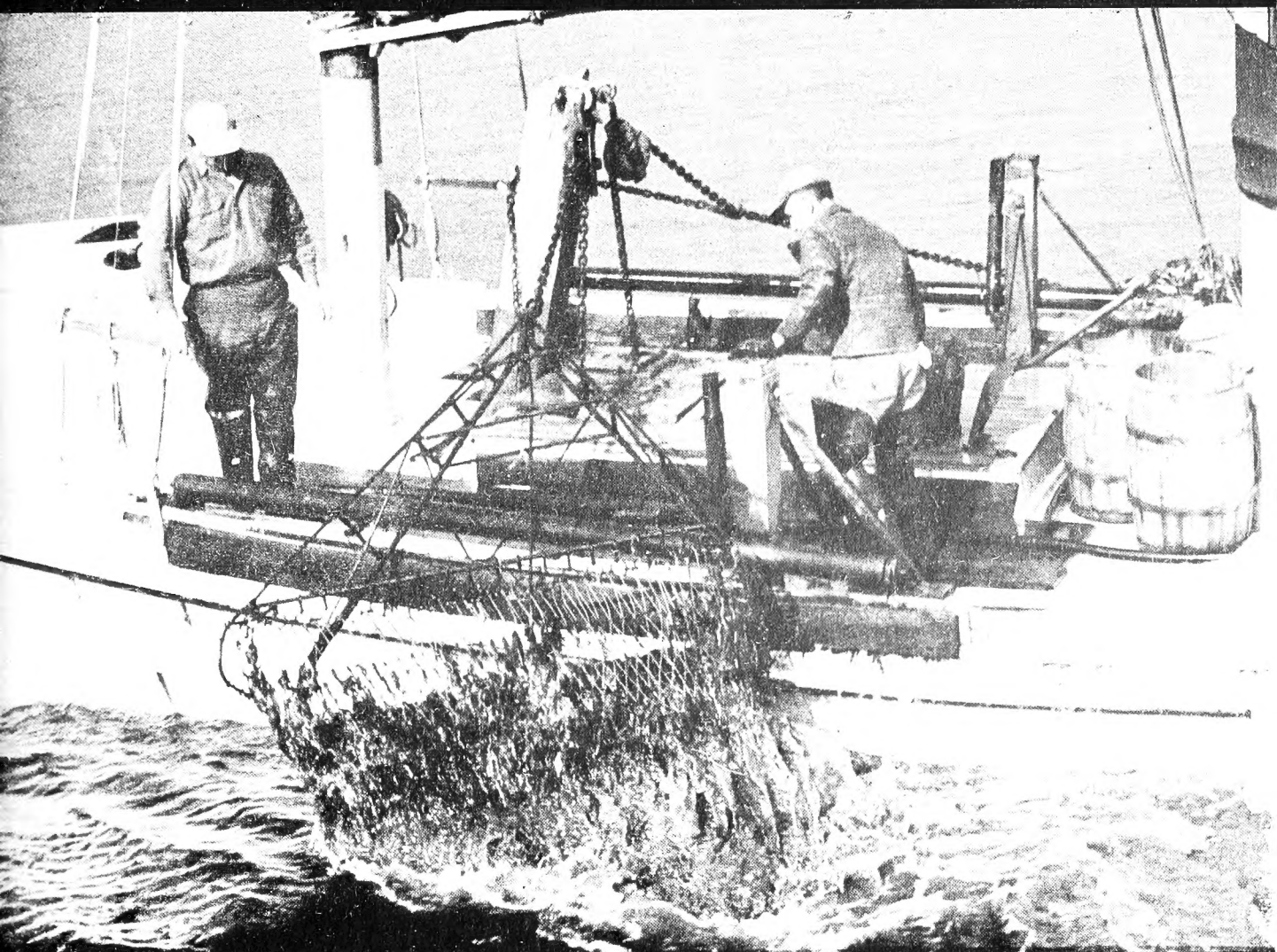


COMMERCIAL FISHERIES REVIEW

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A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

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MECHANIZING THE BLUE CRAB INDUSTRY

Part III - Strengthening the Industry's Economic Position

By Charles F. Lee*, George M. Knobl, Jr.** , and Emmett F. Deady***

ABSTRACT

Because the production of meat from the blue crab has required a large amount of hand labor, the recent amendment of the Fair Labor Standards Act resulted in hardship for the blue crab industry in that compliance with the minimum wage requirement narrowed the spread between cost and selling price. This article suggests a number of measures for strengthening the economic position of the industry by indicating how the spread between cost and price can be widened.

These suggestions involve mechanization of the industry, developing additional markets for the product, and increasing the supply of raw crabs.

INTRODUCTION

The blue crab industry of the South Atlantic and Gulf Coast has faced economic disaster as a result of its being included under a revision of the Fair Labor Standards Act, effective September 3, 1961. In fact, a number of plants were shut down during the first year that this revision of the Act was in effect. Picking the meat from the crab in the production of blue crab meat involves a large amount of hand labor. Prior to September 1961, crab pickers were paid on a piece-work basis, and only the faster pickers were able to earn a dollar or more per hour. Because many of the pickers could not work fast enough to earn this minimum wage required by the Act and because industry profits were already low even under the piecework system with many plants operating marginally--the packers were greatly concerned over the effect of the resulting increase in cost of production.

When funds were appropriated by Congress to provide relief for the industry, a contract was granted to a research and development firm to conduct the necessary investigations into how the mechanization could be accomplished.

The first step the contractor took was to survey the industry to determine what machines are needed and also what changes in the operation of the industry might be helpful to it in the interim period while the desired machines are being developed.

The survey substantiated the opinion that, even aside from the effect of the Fair Labor Standards Act, the crab industry as a whole was in serious economic trouble. From the survey it became clear that new machinery and methods must do more than merely offset the immediate increased cost of labor resulting from the amendment to the Fair Labor Standards Act. The survey indicated that the blue crab industry, even for some time before being included under the Act, was not particularly geared to growth and profit and, indeed, had at times operated below actual cost. In short, survival of the industry in its present form was in danger, minimum wage or no.

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As a result of the contractor's survey, he made three major suggestions, as follows:

1. That the industry needs a "family" of four machines to provide the flexibility required because of the great differences in plant size and economic health. The purpose of the first article in the present series was to report the contractor's recommendations concerning this "family" (Lee, Knobl, and Deady, 1963).
2. That there are certain modifications in plant practice that the individual operator can make to enable his plant to remain in business during the interim period required for mechanization. The purpose of the second article (Lee, Knobl, Abernethy, and Deady, 1963) in the present series was to report the contractor's recommendations concerning these modifications.
3. That in addition to mechanization, other steps are needed in order to strengthen the industry's economic position. The purpose of the present paper is to report the contractor's recommendations for industry action by which it might strengthen itself economically.

The industry's current difficulty is due to a lack of spread between cost and selling price, which leaves little room for profit. The solution to the problem is, of course, to lower the cost by introducing economies in production and/or to improve the price structure by creating greater demand for the industry's products. Accordingly, in the present article, we discuss the following three main topics:

1. The lack of spread between production cost and selling price.
2. The possibility of lowering the cost by introducing operating economies (mainly through mechanization).
3. The possibility of improving the price structure by creating greater demand.

LACK OF SPREAD BETWEEN COST AND SELLING PRICE

Using average yield data and an average price for raw crabs based on the assumption that two-thirds of the catch is purchased during the summer season and that one-third is purchased at a higher price during the off season, we computed that the average cost of the raw crabs yielding 1 pound of crab meat (lump, flake, and claw in normal proportions) was 29 cents. The average picking cost, based on plant records and Labor Department surveys, was 27 cents per pound^{1/}. Costs of cooking, cans, ice, and utilities added another 28 cents, making the average direct cost of production of 1 pound of crab meat 84 cents. The average sale price was computed as shown in table.

From these figures, it is evident that industrywide, on an average year-round basis, the packer has a margin of only 16 cents per pound above direct costs to pay for transportation, losses from spoilage, salary costs of management, accounting,

office costs (telephone and supplies, etc.) and cover such items as depreciation, taxes, and insurance. Only a few of the plants had records that made it possible to determine these costs accurately. Records of one plant, however, indicated that these indirect costs totaled 15 percent, or in this case 15 cents.

Although it is, perhaps, unjustifiable to speak of the crab industry in terms of an "average" plant and "average" costs, yet the estimate of a net profit of 1 cent per pound is certain-

^{1/}These data were obtained during the survey period, October 1961-January 1962, and may have changed since that time.

| Style of Meat | Average Price of Meat | Average Relative Yield | Average Price of Meat |
|-----------------|-----------------------|------------------------|---|
| | Dollar Per Pound | Percent | Dollars Per Proportionate Part of a Pound |
| Lump | 1.40 | 28 | 0.39 |
| Flake | 0.90 | 52 | 0.47 |
| Claw | 0.70 | 20 | 0.14 |
| Total | | 100 | 1.00 |

ly an indication of trouble in many plants. It is obvious that there is not sufficient spread between costs and selling price to sustain the industry, even at the present \$1.00 per hour minimum wage, to say nothing of the \$1.15 and the \$1.25 per hour wage with which it will be faced in September 1964 and September 1965, respectively.

Though it would be desirable to have a more extensive inspection of industry cost records so as to evaluate the range of spread between cost and selling price more precisely, the foregoing data are sufficient to indicate the critical situation in which the industry now finds itself.

POSSIBILITY FOR LOWERING COST OF PRODUCTION BY INTRODUCING OPERATING ECONOMIES

In this section, we consider the major factors in the cost of production, which will show that one of the major factors is the cost of labor. We then consider the economic value of mechanization.

MAJOR FACTORS IN THE COST OF PRODUCTION: The cost of production varies principally with:

1. Seasonal change in cost of raw crabs. This cost ranges from $3\frac{1}{2}$ to 9 cents per pound.
2. Cost of picking labor. At \$1.00 per hour, pickers are paid from 23 to 38 cents per pound of crab meat. Experienced pickers (the main labor force) are scarce, but there are almost no trainee or recruiting programs. A large proportion of the workers are over 50 years of age.
3. Yield of meat. The average yield may range from 11-16 pounds of meat per 100 pounds of raw crabs. During months of high production when crabs are cheap, the yield is highest; and vice versa.
4. Proportion of lump, flake, and claw meat obtained per pound. The price per pound of lump meat is about twice that of claw meat and flake meat, so that the proportional yield of lump meat is a major factor in determining profit margin.
5. Cost of shipment of crab meat to market (and of raw crabs to plant). The cost of shipping the meat ranges from 3 to 9 cents per pound.

One of the major factors in the foregoing list is the cost of labor, especially under the requirements of the amendment to the Fair Labor Standards Act. This law sets interim minimum wages of \$1.00 per hour until September 3, 1964. It then sets interim minimum wages of \$1.15 per hour--the wage that is to prevail until September 3, 1965. At that time the industry must pay a minimum of \$1.25 per hour. Some uncertainty as to these \$1.00 and \$1.15 interim rates exists, however, because owing to their nature, various crab-packing operations may have been brought under an "enterprise" classification. This classification carried with it an immediate \$1.15 minimum that was raised to \$1.25 on September 3, 1963.

To assist the packers in adjusting to the new minimum wages, the Department of Labor at first permitted handicapped-worker certificates for those elderly pickers who are below average producers as well as for those crab pickers who are handicapped for the job. However, these provisions for paying handicapped workers at less than the minimum wage are being eliminated in several steps, resulting in a continuing increase in labor costs even prior to September 3, 1964.

ECONOMIC VALUE OF MECHANIZATION: Since the survey showed that it was feasible to reduce the cost of labor by mechanization, it was desirable to estimate what savings would potentially result. This estimate would serve as a guide to the amount of money that the individual plants might be expected to invest in mechanization, which in turn would determine

the size and complexity of the machines to be developed. In the case of any contemplated machine, it is, of course, difficult to arrive at its economic value. At best, such an estimate must be based on an "educated guess." Making such an estimate requires estimating values for such factors as original costs, interest rates, efficiency, power requirements, maintenance problems, and repair costs. In the case of the blue crab industry--which is characterized by a wide variety of economic, geographic, and other differences--the problems are compounded by the many variations possible.

Based, however, on the probable elimination of 90 percent of the picking labor when the whole family of four machines is used (10 percent of the best workers could maintain and operate the new equipment), direct savings of about \$20,000 per year might be anticipated for a typical plant having some 25 pickers when they are being paid \$1.00 per hour. If savings were figured on the basis of \$1.25 hourly wage, a correspondingly larger saving would be realized. Cost of power, maintenance, and repairs would reduce the estimated savings, but possibly \$15,000 per year would still be available for financing of mechanization, including original costs of the machines, interest, and depreciation.

The most recent development resulting from the contractor's investigations has been the design of a novel and basically simple machine for cleaning and debacking the crabs. This machine is designed to handle about one crab per second and will probably cost about \$2,000 per unit. Moreover, the machine has been designed with the idea of attaching a second relatively simple machine for removal of the lump meat. The contractor believes that in combination, these two machines alone will enable the industry to operate at a profit with the \$1.25 wage.

Profits from the addition of the claw- and flake-picking machines would support much needed cooperative exploratory studies and development of new gear for catching crabs. With the successful mechanization of the cleaning and picking operations, the future government-industry program should include development of rapid pasteurization methods, and continuing biological studies of the resource, exploratory fishing and gear studies. It is reasonable to expect that the next 5 to 10 years will see a completely new crab industry with a sound economic base for the first time in many years.

POSSIBILITY FOR IMPROVING THE PRICE STRUCTURE BY CREATING GREATER DEMAND

To make concrete proposals for improving the price structure, the contractor conducted a brief marketing study to obtain a better understanding of the industry's marketing problem. With this factual background, he then made a number of specific recommendations.

The main topics discussed in this section of the article therefore are:

1. Marketing study.
2. Proposed marketing program.

MARKETING PROBLEMS: The initial survey of the industry indicated that one serious block to progress is the present pattern of marketing. A limited survey therefore was made to learn more of the nature of the problem. In this survey, the Baltimore crab market was selected for study, not because it is typical, but rather because it is the largest crab market in the country and is the main sales outlet for a great many of the smaller plants. This survey revealed that:

1. With the exception of some hotel and restaurant managers who appreciate the benefit of the longer shelf life, pasteurized crab meat does not sell nearly as readily as does the fresh meat. Some prejudice against pasteurization apparently resulted from use of this process to hold spoiling, over-age meat during the early trial-period of pasteurization. Packers also object to the extra can and storage costs and the inventory tied up in storage. However, the

short (6-10 days from picking) shelf life of the fresh meat leads to considerable loss at the retail level, which loss reverts to the crab meat packer.

2. Quality of pack is variable from picker to picker. The cans are not coded to identify the pickers for the packs of low quality. Standardization and control of quality thus are badly needed.
3. Dredged crabs, the only crabs available locally during the winter in Chesapeake Bay, are the source of another factor that reduces quality--sand in the meat. Crab meat shipped from Florida and Louisiana during this period has a price advantage because the meat is cleaner. In the South, crabs are taken in crab pots (traps) the year around.
4. Most of the crab meat coming into Baltimore is bought by commission merchants. When the packer ships the meat, he often does not know what price he will receive for his product--or even that it will be sold.

PROPOSED MARKETING PROGRAM: Among the packers there exists no well-organized pattern of cooperation to solve such common problems as uniformity of product, product specifications, marketing, and advertising.

Most of the packers attempt to sell their products in long-established markets. There seems to have been no concerted effort by the industry to develop new markets.

Accordingly, the contractor made a number of specific proposals for expanding existing markets. However, it was evident that if the market for blue crab is expanded, the problem of supply of raw crabs may become critical. He, therefore, also made a number of suggestions relating to the supply. An increased supply of raw crabs not only would permit an expanded market and thereby strengthen the price structure but would also help stabilize production costs. Stabilization of the price of the raw crabs will benefit both the fishermen and the processors. The contractor's suggestions regarding the expansion of the market for the product and the expansion of the supply of the raw crabs are discussed in the following subsections.

Expansion of the Market: A marketing program will require an industrywide cooperative effort. Emphasis should be placed on new processes that will provide more stable market forms of the product as well as greater control of quality. Pasteurization should be perfected to the point where the product is entirely acceptable by the market for fresh crab meat and to the point where most of the pack can be so treated. Greater effort should also be devoted to expanding the production of frozen specialty products.

Only when stable products of uniform quality are available will it be practical to extend the market area to include the smaller towns and inland regions that are not in the present pattern of distribution of fresh, chilled crab meat. There seems little doubt that the current marketing pattern had its origin in the very short shelf life of the chilled product. A strong marketing program is needed to change this pattern. The development of a stable market would help greatly to stabilize the price of crab meat, and a stabilized price would increase industry profits by enabling management to establish a more even schedule of production.

Expansion of the Supply of Raw Crabs: The conversion to general use of pasteurization and efforts to expand the market for crab meat into new regions should be preceded by, and later be concurrent with, a program to improve the supply of live crabs. Although in areas such as Chesapeake Bay, there are indications that the harvest of live crabs is already near its maximum yield, this condition is not believed to be representative of the potential yield of blue crabs in all other parts of its range. The production of the South Atlantic and Gulf Coast States, for example, has been approximately doubled in the past decade, and this increase has occurred without any really coordinated industry effort.

There are still large regions within the range of blue crabs where there are very few or no crab plants. Exploration of these new shore areas offers an opportunity to increase pro-

uction. New gear for catching crabs, such as tangle nets or trawls that would permit exploitation of possible deeper-water crab populations, needs study. Crab fishermen often make but little effort to follow even local shifts in the crab populations that occur due to temporary changes in salinity in the estuarine areas where the crabs are most generally concentrated. Efforts of these types to expand the fishery for blue crabs should be accompanied by biological studies, with the objective of determining the maximum sustained yield of the fishery from the major production areas and the factors that influence the annual yield.

CONCLUSIONS

Briefly stated, the needs of the crab industry to place it on a solid economic base are threefold:

1. The cost of production must be reduced. It is believed that the mechanization program will achieve this objective.
2. A strong, aggressive, and sustained marketing effort by the industry is required to create a stabilized and, eventually, an expanded demand for the product.
3. A concerted effort is needed to expand the catch of live crabs and to minimize the seasonal and annual fluctuation in the catch.

SUMMARY

A survey of the blue crab industry indicated that even before the amended Fair Labor Standards Act, many crab plants operated with little profit. Mechanization therefore will have to do more than simply enable plants to pay the minimum hourly wage required by the Act. Eventually mechanization must also ensure a sufficient margin of profit to permit a cooperative attack by the blue crab industry on such basic problems as limited markets, need to develop modern products, lack of knowledge of the resource, and need for modern harvesting and processing methods.

Direct cost of production varies with changes in the cost of raw crabs, quality of crabs, cost of picking labor, and cost of cans, ice, cooking, etc. The average direct cost of producing a pound of crab meat was calculated to be \$0.84, for which the average sale price was calculated to be \$1.00. The 16 cents difference is barely adequate to pay for shipping and indirect costs, indicating that many plants are already operating at the break-even point or at a loss.

Present marketing practices do not contribute to a stable economic structure for the industry. The quality of the meat is highly variable, and the short shelf life of chilled crab meat causes excessive losses. Yet the pasteurized product, which has a longer shelf life, has not been sufficiently "sold" to either the packer or the potential customer. There has been little cooperative effort by the industry to develop a wider market.

Estimated savings that are anticipated to result from mechanization of a plant employing about 25 pickers would be about \$15,000 per year at the \$1.00 hourly wage. Recent developments in the mechanization studies indicate that the price of the machines may be less than early estimates as the contractor has now been able to simplify his design concepts of both a debacking machine and a lump-picking machine. As the result of this simplification and consequent reduction in the potential cost of mechanization, even the small plants should eventually find complete mechanization economically feasible.

Three conclusions were derived from this study: (1) the cost of producing crab meat needs to be reduced by means of mechanization, (2) a strong marketing effort by the industry is needed, and (3) the catch of crabs should be expanded and the fluctuation in catch minimized.

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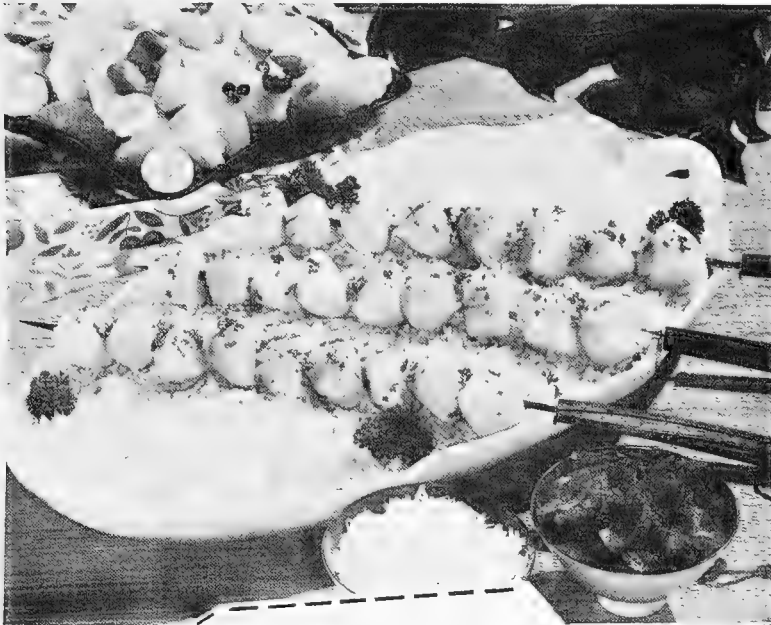
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CURRIED SCALLOPS WITH RICE PILAF



Flavorful scallops from cold New England waters blend readily with savory curry to capture compliments for the imaginative homemaker. Skewered scallops, magically marinated, and broiled until brown, will bring the charm of the Middle East to your table to appease apathetic appetites.

1 1/2 pounds scallops, fresh or frozen
1/2 cup melted fat or oil
1/2 cup cider or apple juice
2 tablespoons chopped parsley

1 teaspoon curry powder
1 teaspoon salt
Rice Pilaf

Thaw frozen scallops. Rinse with cold water to remove any shell particles. Cut large scallops in half. Place scallops in a shallow baking dish. Combine remaining ingredients except Rice Pilaf; mix thoroughly. Pour sauce over scallops and let stand for 30 minutes, stirring occasionally. Remove scallops, reserving sauce. Place scallops on 6 skewers, approximately 7 inches each. Place on a well-greased broiler pan. Brush with sauce. Broil about 3 inches from source of heat for 3 to 4 minutes. Turn carefully and brush with remaining sauce. Broil 3 to 4 minutes longer. Serve over Rice Pilaf. Serves 6.

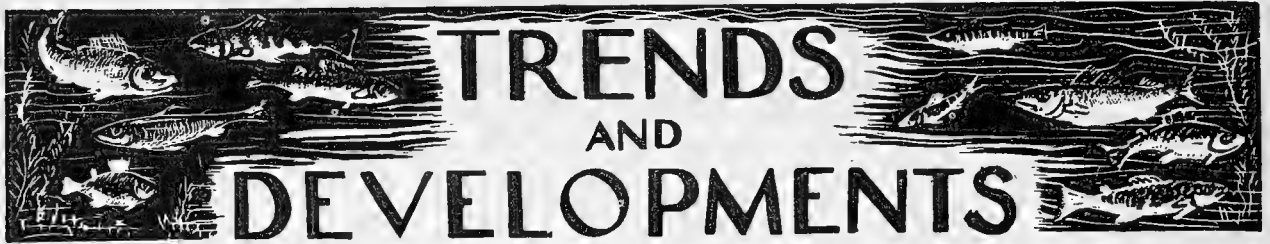
RICE PILAF

1 cup uncooked rice
2 tablespoons melted fat or oil
1 package (1-3/8 or 1 3/4 ounces) onion soup mix

2 1/2 cups boiling water
1/4 cup chopped parsley

Cook rice in fat until golden brown, stirring occasionally. Add soup mix and water; stir. Cover and bring to the boiling point. Reduce heat and simmer for 30 to 35 minutes or until liquid is absorbed. Add parsley. Serves 6.

--From Fisheries Marketing Bulletin: "Protein Treasure from the Seven Seas," Issued by the National Marketing Services Office, U. S. Bureau of Commercial Fisheries, Chicago 5, Ill.



TRENDS AND DEVELOPMENTS

Alaska

BRISTOL BAY AREA OFFICE SHIFTED TO TOWN OF KING SALMON:

The location of Alaska's commercial fisheries headquarters office for the Bristol Bay area at King Salmon on a year-round basis was announced by the Commissioner of the Alaska Department of Fish and Game on November 1, 1963. Formerly, this office was located at King Salmon during the fishing season and at Dillingham, Alaska; for the remainder of the year.

The reason for the change is due to the fact that King Salmon is more centrally located to the major fishing areas, and living accommodations are now available there for the area biologist. Economy and efficiency will be best served by making King Salmon a permanent station and the area headquarters office.

Two of the four biologists assigned to the Bristol Bay area were to remain at Dillingham.

Kenneth R. Middleton, formerly an assistant biologist in the Bristol Bay area, has been named Area Management Biologist. Middleton graduated from the University of California and worked 18 months for the California Department of Fish and Game before joining the Alaska Department of Fish and Game in 1960.



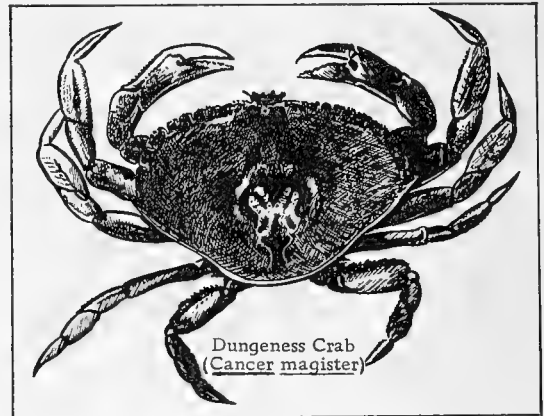
California

ABUNDANCE AND CONDITION OF DUNGENESS CRABS SURVEYED PRIOR TO OPEN SEASON:

M/V "N. B. Scofield" Cruise 63-S-7-Crab (October 5-31, 1963): To determine the pre-season abundance and condition of legal and sublegal Dungeness crabs (Cancer

magister) were the objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield. The area surveyed was in the coastal waters off San Francisco from the Russian River to Point Montara.

Sampling stations were selected randomly from the crab-fishing areas between Point Montara and the Russian River. Commercial crab traps were baited with squid and rockfish and allowed to fish overnight at each of the 71 stations visited.



A total of 5,258 crabs were taken in the traps, 3,022 legal males, 2,077 sublegal males, and 159 females. The average legal catch per trap of 4.3 crabs was only slightly higher than the 4.1 legal crabs per trap taken in 1962. The sublegal catch of 2.93 per trap was down from 1962.

The best catches were north of the San Francisco Lightship in 18 and 19 fathoms of water and north of Double Point in 12 to 27 fathoms of water. Good catches were also made west of Point Montara in 16 to 26 fathoms of water.

The mean shoulder width of the crabs was 174 millimeters (6.8 inches), about 3 millimeters (about $\frac{1}{8}$ inch) larger than the mean

shoulder width of the crabs in the comparable survey made in 1962.

According to the survey, it is believed the catch for the 1963/64 season will be 1.4 million pounds with estimates ranging from 1.1 to 1.6 million pounds. The increase in average size was figured into the poundage estimate for the 1963/64 season.

Note: See Commercial Fisheries Review, February 1963 p. 21.



Cans--Shipments for Fishery Products, January-September 1963

The amount of steel and aluminum consumed to make cans shipped to fish- and shell-fish canning plants during January-September 1963 was down 3.6 percent from that used during the same period in 1962. The decline was due to smaller shipments to the Eastern and Western Areas which was only partly offset by larger shipments to the Southern Area. The pack of salmon and tuna was down on the West Coast. A smaller pack of Maine sardines accounted for the decline in shipments to the East Coast. On the Gulf Coast, however, there was a considerable increase in the pack of shrimp.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JULY 1963:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, less fresh and frozen fishery products were purchased in July 1963 by the Defense Subsistence Supply Centers than in the previous month. The decline was 3.5 percent in quantity and 7.7 percent in value.

Compared with the same month a year earlier, purchases in July 1963 were down 5.2



percent in quantity and 24.6 percent in value. Purchases this July included 540,629 pounds of shrimp, 392,098 pounds of ocean perch fillets, 293,486 pounds of scallops, 170,006 pounds of haddock fillets, 166,124 pounds of flounder fillets, 118,429 pounds of oysters, and 86,348 pounds of halibut, as well as substantial quantities of cod fillets, sole fillets, and clams. Prices paid for fresh and frozen fishery products by the Department of Defense in July 1963 averaged 50.9 cents a pound, 2.3 cents a pound less than in the previous month, and 13.1 cents a pound less than in the same month of 1962.

U. S. Domestic Shipments of Metal Cans for Fishery Products, January-September 1963 and 1962 (Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

| Receiving Area | First Quarter | | Second Quarter | | Third Quarter | | Jan.-Sept. | |
|-----------------|---------------|---------|----------------|---------|---------------|---------|------------|-----------|
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| East 1/ | 155,814 | 158,531 | 215,924 | 189,556 | 276,572 | 341,193 | 648,310 | 689,280 |
| Southern | 21,010 | 13,403 | 38,197 | 32,668 | 34,986 | 21,765 | 94,193 | 67,836 |
| North, Central | - 29 | 63 | 5 | 29 | 8 | 22 | 42 | 114 |
| West 2/ | 381,735 | 414,199 | 629,376 | 701,831 | 594,561 | 562,140 | 1,605,672 | 1,678,170 |
| Total all areas | 558,588 | 586,196 | 883,502 | 924,084 | 906,127 | 925,120 | 2,348,217 | 2,435,400 |

1/Includes Puerto Rico.
2/Includes Alaska and Hawaii.

In January-September 1963, shipments to the Pacific or Western Area accounted for 68.4 percent of total shipments; shipments to the Eastern Area accounted for 27.6 percent; and shipments to the Southern Area accounted for most of the remaining 4.0 percent. Most of the fish-canning facilities are located in the Pacific Area.

Notes: (1) Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. The tonnage figures for steel (tinplate) cans are derived by use of the factor 21.8 base boxes per short ton of steel. The use of aluminum cans for packing fishery products is small.

(2) See Commercial Fisheries Review, Dec. 1963 p. 24.



During the first 7 months of 1963, purchases were down 1.5 percent in quantity and 3.8 percent in value from those in the same period of the previous year.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, July 1963 with Comparisons

| QUANTITY | | | | VALUE | | | |
|--------------|-------|-----------|--------|-----------|-------|-----------|-------|
| July | | Jan.-July | | July | | Jan.-July | |
| 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Lbs.) | | | | (\$1,000) | | | |
| 1,953 | 2,061 | 13,831 | 14,034 | 995 | 1,319 | 7,768 | 8,081 |

Canned: Canned tuna was the principal canned fishery product purchased for use of

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, July 1963 with Comparisons

| Product | QUANTITY | | | | VALUE | | | |
|---------|--------------------|------|-------------|-------|-----------------|------|-------------|-------|
| | July | | Jan. - July | | July | | Jan. - July | |
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| | (1,000 Lbs.) | | | | (\$1,000) | | | |
| Tuna | 174 | 1 | 2,064 | 3,708 | 81 | 1/ | 1,007 | 2,062 |
| Salmon | 2 | 1 | 18 | 1,016 | 2 | 1/ | 12 | 638 |
| Sardine | 24 | 3 | 321 | 53 | 9 | 2 | 131 | 27 |

1/ Less than \$500.

the Armed Forces in July 1963. Total purchases of canned tuna, salmon, and sardines in the first 7 months of 1963 were down 49.7 percent in quantity and 57.8 percent in value from those in the same period of the previous year. The decline was due to lower purchases of canned tuna and salmon.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

(2) See Commercial Fisheries Review, Nov. 1963 p. 28.



Fish Farming

GEAR TESTED FOR HARVESTING FISH FROM RICE FARM PONDS:

Preliminary trials of a specific commercial type haul seine and seine winch were successfully completed recently in a 36-acre flooded rice field pond near Dumas, Ark. These trials were part of the U. S. Bureau of Commercial Fisheries program to assist the fish-farming industry to improve the methods of harvesting farm pond-reared fish. Catches ranged up to 1,200 pounds of buffalo-fish and 20 catfish per haul. Over 223 buffalo-fish, averaging some 5 pounds each, were held alive for two days in a portable water tank to simulate holding the fish for market.

It is felt that with additional refinements, the haul seine and seine winch could be a highly efficient and labor-saving harvesting device particularly for ponds and reservoirs that do not have excessive numbers of snags or similar bottom obstructions. Other advantages of the haul seine gear are: (1) it is unnecessary to lower the pond water level to harvest the fish; and (2) the fish could be obtained for market on shorter notice than with the techniques presently used in the farm pond fishery.



Fish Larvae

FIRST LARVAL FISH BIOLOGY CONFERENCE HELD IN CALIFORNIA:

Tiny and transparent, the vulnerable young or larvae of most important food fishes, such as sardine, herring, tuna, and mackerel are at the mercy of the ocean currents and fair game for predators. These fragile creatures are nevertheless considered by fisheries scientists to be an index of the productivity of the species and an important key to evaluation of any commercial fishery.

At the University of California Conference Center at Lake Arrowhead, October 28-30, 1963, a group of scientists from Scotland, England, Austria, Germany, and the United States gathered to discuss progress in the comparatively unexplored field of larval fish biology. This symposium, sponsored by the U. S. Bureau of Commercial Fisheries Biological Laboratory, La Jolla, Calif., was the highlight of the 1963 California Cooperative Oceanic Fisheries Investigations Conference and attracted researchers from other Bureau laboratories and local colleges and universities.

Contributing papers to the symposium were Mr. F. G. T. Holliday of the University of Aberdeen on the physiology of marine fish larvae; Mr. J. H. S. Blaxter, Marine Laboratory, Aberdeen, on the feeding of herring larvae; Dr. G. Hempel of the University of Hamburg on larval survival; Dr. W. Einsele, Director of the Austrian Freshwater Commercial Fisheries Laboratory at Scharfling on the problems of survival and rearing of European fresh-water fishes; and Mr. James Shelbourne of Lowestoft, England, on the rearing of marine fish for commercial purposes. The United States was represented by Drs. E. H. Ahlstrom, an authority on larval fish taxonomy; Reuben Lasker, who has conducted basic physiological studies on Pacific sardine embryos and larvae; and G. O. Schumann, on behavior of larvae, all from the Bureau's Biological Laboratory at La Jolla; Horst Schwassmann, neuroanatomist of the University of California at Los Angeles, who has studied visual pathways in larval sardines and anchovies; and Professor John Isaacs, Scripps Institution of Oceanography, who explored some basic laws governing the interrelationships of larval sardines and anchovies.

The annual conference on the California Cooperative Oceanic Fisheries Investigations, of which this symposium was a part is spon-

sored by the Federal Government, State conservation agencies, and educational institutions.



Fish Oils

COMPOSITION OF FISH OILS STUDIED BY FRACTIONAL DISTILLATION AND GAS-LIQUID CHROMATOGRAPHY:

Research on the control of chemical alterations in fish and fishery products during storage and processing is being conducted by the U. S. Bureau of Commercial Fisheries Technological Laboratory of Seattle, Wash. One phase, the isolation of highly unsaturated fatty acid fractions will serve the dual purpose of gaining further knowledge of the composition of fish oils and to obtain fractions of the highly unsaturated fatty acids. Some of these fractions are being sent to various laboratories for use in medical, nutritional, and biochemical research problems.

Gas-liquid chromatography of the various distillate fractions of fatty acids provided valuable retention volume data for characterizing certain components of critical pairs in single gas-liquid chromatography column analyses.

Results of these experiments point to the value of low-pressure fractional distillation to readily produce a fraction of polyunsaturated fatty acids from an undistilled residue material. Further work is needed to determine the extent of chemical alterations, if any, to the fatty acid chain and location of double bonds. The experiment has provided valuable qualitative standards for gas-liquid chromatography.

Note: See Commercial Fisheries Review, August 1963 p. 22.



Great Lakes Fishery Investigations

DEPTH DISTRIBUTION STUDIES OF CHUBS AND ASSOCIATED SPECIES IN LAKE MICHIGAN CONTINUED:

M/V "Cisco" Cruise 11 (November 6-15, 1963): To study the bathymetric distribution of coregonids (chubs) and associated species during the fall overturn and to collect materials for electrophoretic and serological studies were the main objectives of this cruise in southeastern Lake Michigan by the U. S. Bu-

reau of Commercial Fisheries research vessel Cisco. Work was interrupted repeatedly by inclement weather.

The water was homothermous from surface to bottom out to a depth of about 25 fathoms. Surface water temperatures were mostly 11.4° to 13.2° C. (52.5° to 55.8° F.) On about the same dates in 1962, water in the same area was approximately 2° C. cooler at the surface and was homothermous out to a depth of 35 fathoms.

One or more bottom trawl tows were made at 5-fathom intervals from 5 to 40 fathoms, and at 3, 7, 12, and 17 fathoms. Fish distribution was noticeably different than in August 1963, the date of the last previous sampling. Appreciably warmer bottom temperatures in the 10- to 25-fathom depth range resulted in a generally deeper distribution of all species except sculpins and alewives, which exhibited no definite change.

Blood and flesh samples for electrophoretic and serological studies were collected from chubs caught in Lake Michigan and from northern pike and white suckers collected in the Kalamazoo River.

Half-meter plankton nets towed at various levels over bottoms of 5, 15, and 25 fathoms did not take fish fry. Filamentous algae and large crustacean zooplankton were scarce at those depths, although a few large cladocerans (Leptodora kindti) were observed.

Notes: (1) The M/V Cisco was assigned to Lake Erie for limnological studies by the U. S. Bureau of Commercial Fisheries during cruise 8 (August 28-September 13) and by the U. S. Public Health Service during cruise 9 (September 24-October 8) and cruise 10 (October 15-29, 1963). Reports on those cruises will not be issued by the Bureau's Biological Laboratory at Ann Arbor, Mich.

(2) See Commercial Fisheries Review, Oct. 1963 p. 21.

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LAKE TROUT DISTRIBUTION STUDIES CONTINUED:

M/V "Siscowet" Cruise 9 (October 14-29, 1963): To assess the spawning population of lake trout in the Apostle Islands region of Lake Superior was the main objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Siscowet. Unseasonably warm and calm weather extended the spawning run into late October, when unspent fish were still found in the cruise area.

A total of 60,300 feet of large-mesh gill nets (4½- to 6½-inch mesh) fished on spawning

grounds near Gull Island Shoal and south of Basswood Island yielded 235 spawning lake trout, nearly all of which were tagged and released. The catches included 30 females, as compared to 3 spawning females captured during the spawning season of 1962. Six lake trout were recaptured which had been tagged on the same spawning grounds in 1962. Of the 218 lake trout captured on Gull Island Shoal, only 3 (1.4 percent) were fin-clipped. The catches south of Basswood Island (17 fish) included 4 fin-clipped lake trout (23.5 percent).

It was learned that limited fishing by the Wisconsin State Conservation Department in the inshore area of the Apostle Islands yielded 27 spawning lake trout (4 females) of which 7 (25.9 percent) were fin-clipped. The higher incidence of fin-clipped lake trout among the inshore spawning populations suggests that hatchery-reared lake trout may tend to return to areas near the original planting site to spawn.

The lengths of the spawning lake trout captured by the Siscowet ranged from 20.0 to 30.6 inches and averaged 26.4 inches (compared to 25.8 inches in 1962). The 30 females ranged in length from 24.3 to 30.0 inches and averaged 27.8 inches (compared to 29.2 inches for the 3 females taken in 1962). Considerable difficulty was encountered in determining ages of the spawning lake trout. Tentative age determinations for 111 males and 30 females gave the following percentage age distribution: five years, 7.8 percent; 6 years, 26.9 percent; 7 years, 34.8 percent; 8 years, 29.8 percent; and 9 years, 0.7 percent.

Small-mesh gill nets (1½- and 2½-inch mesh) fished on the spawning grounds caught predominately longnose suckers, with fewer numbers of round whitefish, lake northern chubs, and lake herring. No lake trout eggs were found in the several stomachs examined from each species.

Water temperatures were unseasonably high throughout the cruise. Surface temperatures ranged from 12° C. (53.6° F.) south of Basswood Island to 13.4° C. (56.1° F.) on Gull Island Shoal.

Note: See Commercial Fisheries Review, Dec. 1963 p. 26.



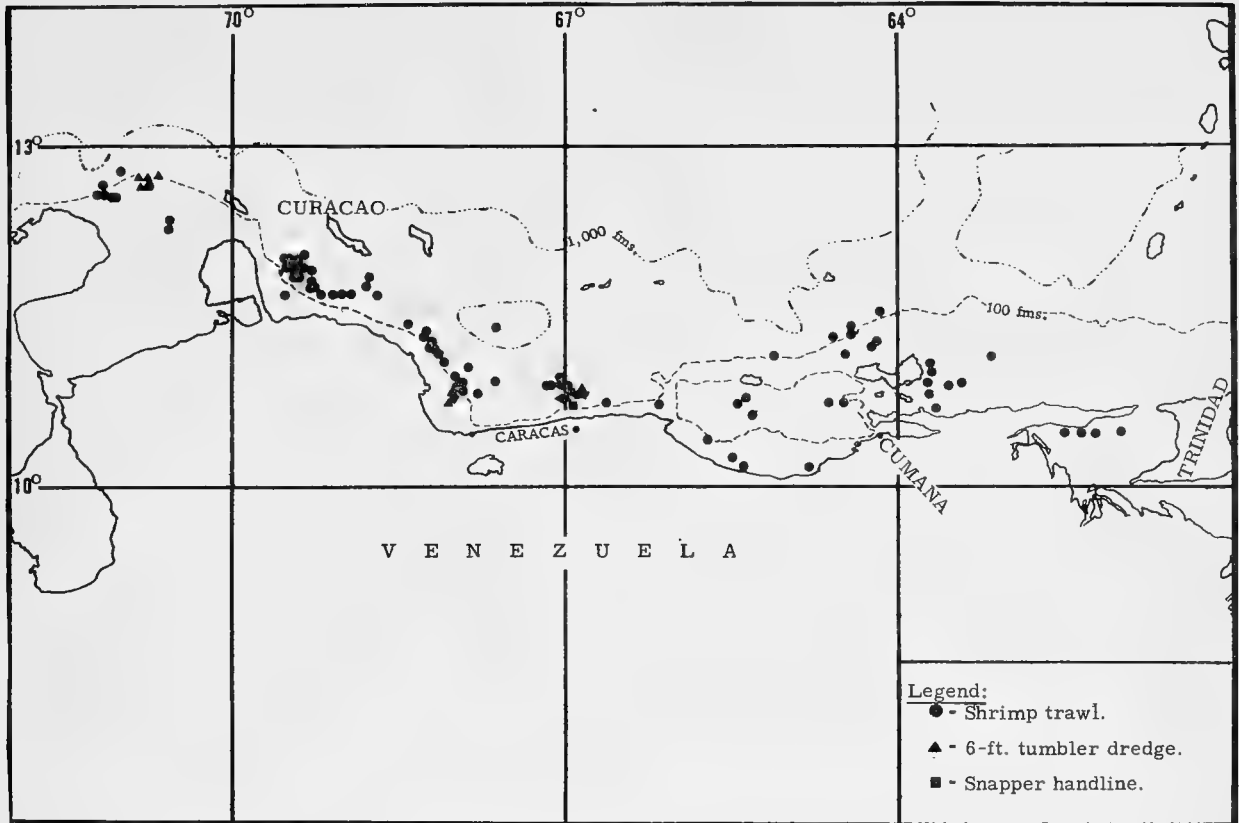
Gulf Exploratory Fishery Program

PRELIMINARY SURVEY OFF THE COAST OF VENEZUELA:

M/V "Oregon" Cruise 87 (September 17-November 4, 1963): The primary purpose of this 48-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon was to conduct a preliminary survey of the resources of the Continental Shelf and Slope off the Caribbean coast of Venezuela. That area had constituted one of the largest gaps in exploratory fishing coverage of the Caribbean. Transects were run across the shelf and slope from 30 to 100 fathoms in international waters between the Gulf of Venezuela and Caracas (Venezuela), and from 5 to 700 fathoms between Caracas and Trinidad. Four additional drags were made in the Gulf of Paria. Port calls were made at Williamstad, Curacao; LaGuiara and Cumana, Venezuela; and Port of Spain, Trinidad.

From the Gulf of Venezuela to Caracas, depths shallower than 100 fathoms were marked generally by rough bottom conditions, and considerable gear damage was experienced. A few successful drags, with trawls rigged with mud rollers, resulted in catches of pink and brown shrimp (Penaeus duorarum and P. braziliensis) in amounts less than 10 pounds per drag, and in 10- to 25-pound catches of 0.5- to 3.0-pound lane snapper and vermilion snapper. One drag east of the Gulf of Venezuela produced a catch of 50 pounds of 3- to 8-pound scamp (Myctoperca falcata). Fishing for snapper with roller-rigged fish trawls might be more productive than shrimp trawl results indicate in the general area inside 100 fathoms from the mouth of the Gulf of Venezuela to the Golfo de Triste.

Extensive areas suitable for trawling were found in the 200- to 600-fathom depth range along the eastern edge of Pena Paraguana and from Punta Zamuro to the Golfo de Triste. Royal-red shrimp (Hymenopenaeus robustus) were taken in small numbers from 200 to 400 fathoms. The best catches amounted to 25 to 45 pounds (heads-on) per 3-hour drag and occurred between 220 and 240 fathoms where water temperatures averaged 10° C. (50° F.). Due to the presence of small finger coral over much of that depth range, the use of mud rollers was obligatory, but gear damage was slight. The pink speckled shrimp, Penaeopsis megalops, was also present on the slope in depths of 180-230 fathoms, with the heaviest



Areas investigated during Cruise 87 of the M/V Oregon (September 17-November 4, 1963).

concentrations in 200-225 fathoms. One drag in 225 fathoms took 150 pounds (heads-on) of pink speckled shrimp. Also present in deeper drags, but generally in quantities less than 15 pounds per drag, were the scarlet prawn (*Plesiopenaeus edwardsianus*), two additional penaeids--*Aristaeomorpha foliacea* and *Aristeus antillensis*--and the striped pandalid shrimp (*Plesionika longipes*). Fish catches in deep water were lower than catches in comparable depths and temperatures in the Gulf of Mexico or off the east coast of the United States. In those areas, whiting (*Urophycis*) and hake (*Merluccius*) often dominate the fish catches on royal-red shrimp grounds, but such species were markedly less abundant off Venezuela where rattail fish (*Macrouridae*) dominated many catches and were represented by at least 19 species.

Trawling east of Caracas was confined largely to shelf depths, except for transects across the enclosed basin near Margarita Island. Those transects, running from 100 to 700 fathoms, indicated that the basin is devoid of life in its deeper depths, due probably to anaerobic conditions. Drags on the shelf

inside 20 fathoms produced small to moderate catches of croakers (*Micropogon*) and other sciaenids and small catches of lane and vermilion snappers. Efforts to locate concentrations of the South American white shrimp, *Penaeus schmitti*, were unsuccessful along the Caribbean coast, and only small numbers were found in the limited work accomplished in the Gulf of Paria. Dredge drags between Isla Tortugas and the mainland of Venezuela yielded small numbers of scallops which resembled the calico scallop of the Gulf of Mexico. The largest scallop catch was 25 pounds, with other catches averaging less than 2 pounds.

Trolling lines and a careful bridge watch to detect surface schooling tuna were maintained when the vessel was running. Few schools were seen. One unsuccessful attempt was made to sample a school of blackfin tuna in the mid-Caribbean with a 6-inch monofilament gill net.

* * * * *

SHRIMP GEAR STUDIES CONTINUED:
M/V "George M. Bowers" Cruise 48--
Phase I (October 14-25, 1963): The purpose

of Phase I of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers was to conduct initial field tests of a prototype 40-foot electrical shrimp trawl. The tests were designed to establish the effectiveness of the experimental gear in harvesting burrowed shrimp during daylight hours.

METHOD OF OPERATION: A 40-foot flat trawl with a 6-foot by 32-inch doors rigged with a tickler chain was fished on the starboard outrigger. The electrical trawl was fished simultaneously on the port side. Both trawls were set and hauled at the same time and fished with identical warp lengths. Drags were of one hour duration. Tests were conducted at night as well as during the day. The night tests were primarily to establish the approximate quantity of shrimp available in the area.

AREA OF OPERATIONS: Comparative trawling tests were conducted off Florida in the Apalachicola-Carrabelle area; specifically, in St. George Sound behind Dog Island in 3-4 fathoms and offshore approximately 15 miles southeast of Cape San Blas in 10-12 fathoms.

St. George Sound: Physical conditions in this area during trawling tests were: (1) bottom type--brown mud; (2) water condition (surface)--green, turbid; (3) bottom salinity--33-35 parts per thousand; and (4) bottom temperature--22.5°-23.3° C. (72.5°-73.9° F.).

Night catches in the area averaged about 30 pounds of 31-35 count pink shrimp per hour in each trawl. The night catches with the electrical gear were slightly greater than with the standard trawl.

During the day, catches with the electrical trawl ranged from 19 to 36½ pounds whereas the standard trawl catches ranged from 8¼ to 14½ pounds. The ratio of electrical to standard catch on each drag ranged from 1.5:1 to 3.8:1. The 3 significant factors noted in this series of 15 paired drags were: (1) the electrical gear was producing significantly greater catches than the standard trawl during daylight hours; (2) the electrical gear was not producing daylight catches as large as those taken at night with either trawl i.e., it was not taking all the shrimp available; and (3) the entire shrimp population was not burrowed during the day because daytime catches were made with the standard trawl.

The trash fish catch with the two trawls was approximately equal.

Offshore Cape San Blas: Physical conditions in this area during trawling tests were: (1) bottom type--sand and mud; (2) water (surface)--blue, clear; (3) bottom salinity--38.5 parts per thousand; and (4) bottom temperature--24.5° C. (76.1° F.).

Night catches in the area averaged about 22 pounds of 16-20 count pink shrimp per hour per trawl. Catches were approximately equal with each trawl. During daytime fishing, catches with the electrical trawl ranged from 12 shrimp to 9 pounds and standard trawl catches ranged from 0 to 7 individual shrimp. The significant factors observed in this series of tows were: (1) the electrical trawl was influencing the daytime catch but taking only a small percentage of the shrimp available; and (2) all shrimp were burrowed during daylight hours as evidenced by the lack of catch in the standard trawl.

CONCLUSIONS: The tests demonstrated that the electrical shrimp trawl is capable of harvesting burrowed pink shrimp that are not available to conventional gear. They also indicated that field strengths developed within the electrode array were partially inadequate. This was particularly evident on the high salinity offshore grounds. Additional laboratory tests were scheduled to determine the modifications needed in the pulse generator and electrode array to improve field strength. Phase II of Bowers Cruise 48 utilizing modified electrical apparatus was to be conducted during November 1963 in the localities described above.

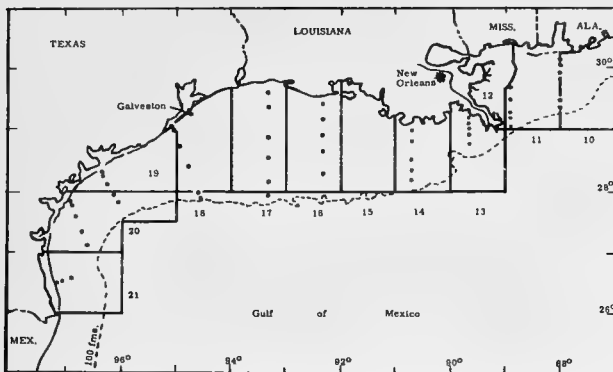
Note: See Commercial Fisheries Review, December 1963 p. 27.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-10 (October 20-November 4, 1963): Catches of brown shrimp were light to moderate during this cruise off the coast of Alabama, Mississippi, Louisiana, and Texas by the chartered vessel Gus III. The vessel (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries) was engaged in a continuing study of the distribution of shrimp in the Gulf of Mexico.



Shows the station pattern for the shrimp distribution studies in the Gulf of Mexico during Cruise 10 of Gus-III.

Ten statistical areas (10, 11, 13, 14, 16, 17, 18, 19, 20, and 21) were covered. One 3-hour tow with a 45-foot shrimp trawl was made in each of 3 depth ranges (0-10, 10-20, and over 20 fathoms) in those areas.

Moderate catches of brown shrimp were made off Mississippi and Texas, and white shrimp were found in the under 10-fathom depth along the western Gulf coast.

The best single catch consisted of 87 pounds of 15-20 count brown shrimp from the 10-20-fathom range in area 19. That area also yielded 25 pounds of 21-25 count white shrimp from depths below 10 fathoms.

Area 18 produced 14 pounds of 26-30 count white shrimp from the under 10-fathom depth, 17 pounds of 26-30 count brown shrimp from the 10-20-fathom range, and 14 pounds of 15-20 count brown shrimp from over 20 fathoms.

Off southern Texas, area 20 yielded 25 pounds of 26-30 count white shrimp from under 10 fathoms and 22 pounds of 15-20 count brown shrimp from over 20 fathoms. In area 21, a catch of 28 pounds of 21-25 count brown shrimp was made in the 10-20 fathom range.

The catch off Louisiana was generally light, although a tow in under 10 fathoms off Cameron, La., produced 25 pounds of white shrimp, and sampling in the Mississippi Delta area yielded 12 pounds of 21-25 count white shrimp from under 10 fathoms, 17 pounds of 21-25 count brown shrimp from the 10-20-fathom depth, and 20 pounds of 21-25 count brown shrimp from over 20 fathoms.

In area 11 of the Mississippi coast, a catch of 41 pounds of 15-20 count brown shrimp was

taken from 10-20 fathoms and 35 pounds of 15-20 count brown shrimp were caught in over 20 fathoms.

In area 10 off Alabama, a tow at the over 20 fathoms station produced 17 pounds of 12-15 count brown shrimp, and trawling in the 10-20-fathom range yielded 6 pounds of 15-20 count pink shrimp. That was the largest catch of pink shrimp taken during the cruise. (The occasional catches of pink shrimp at other stations did not exceed 2 pounds each.)

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, Dec. 1963 p. 32.



Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-OCTOBER 1963:

Skipjack tuna landings in Hawaii in October 1963 were about 400,000 pounds, 244,000 pounds below the 1948-62 average for the month. The cumulative total catch for January-October 1963 was 7.8 million pounds, almost 1.6 million pounds below the 1948-62 average for the same period.

During October there were 89 productive trips, giving an average of 3,074 pounds per productive trip. Individual catches ranged from 114 pounds to 10,165 pounds.



Industrial Fishery Products

NEW USES FOR FISH OILS PROMOTED AT ANNUAL PAINT INDUSTRIES SHOW:

The U. S. Bureau of Commercial Fisheries and the National Fisheries Institute (NFI) jointly sponsored an exhibit and booth at the 28th Annual Paint Industries' Show held in Philadelphia, Pa., October 30-November 2, 1963. The Show was described as an educational exhibit of equipment and materials for decorative and protective coatings manufacturers. To the exhibitor, it offered a unique opportunity to present new materials or new applications of materials and equipment to a carefully selected group of technologists and production personnel of the decorative and protective coatings industry.

The Bureau's exhibit used as its theme "Marine Oils. . . Progress Through Re-



U. S. Bureau of Commercial Fisheries exhibit and booth at Paint Industries' Show, Philadelphia, Pa. (October 30-November 2, 1963).

search." It was composed of four panels telling of the properties of marine oils, one panel showing a very colorful presentation of the chemical structure of some of the fatty acids found in these oils. Many favorable comments were heard about the exhibit, and numerous questions regarding the chemistry and uses of marine oils were asked by the many visitors who stopped by the booth. Reprints of some publications reporting research conducted on marine oils at the Bureau's Technological Laboratory in Seattle and a fishery leaflet showing some typical uses for marine oils were distributed at the booth.

In addition to the Bureau exhibit, two other exhibitors made direct mention of marine oils, one being a producer of menhaden oil and the other a large user of such oil. The Bureau booth was manned by a member of the Technical Advisory Unit and a research chemist from the Seattle Technological Laboratory.

U. S. FISH MEAL, OIL, AND SOLUBLES:

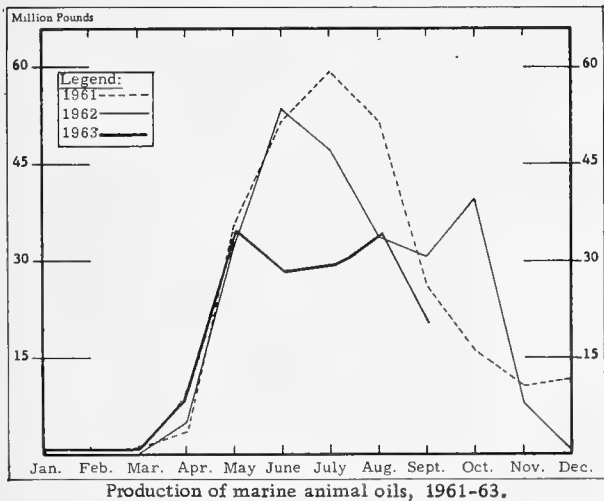
Production by Areas, October 1963: Preliminary data on U. S. production of fish meal, oil, and solubles for October 1963 as collected

by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

| U. S. Production ^{1/} of Fish Meal, Oil, and Solubles, October 1963 (Preliminary) with Comparisons | | | | |
|---|-----------------------|------------------------|--------------------------------|---------------------------|
| Area | Meal Short Tons | Oil 1,000 Pounds | Solubles .. (Short Tons) .. | Homogenized ^{3/} |
| October 1963: | | | | |
| East & Gulf Coasts | 14,600 | 12,951 | 5,669 | - |
| West Coast ^{2/} | 3,261 | 1,029 | 2,090 | - |
| Total | 17,861 | 13,980 | 7,759 | - |
| Jan.-Oct. 1963 | | | | |
| Total | 213,244 | 167,323 | 86,744 | 7,216 |
| Jan.-Oct. 1962 | | | | |
| Total | 275,242 | 244,009 | 105,893 | 8,915 |
| ^{1/} Does not include crab meal, shrimp meal, and liver oils. ^{2/} Includes Hawaii, American Samoa, and Puerto Rico. ^{3/} Includes condensed fish. Note: Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon. | | | | |

Production, September 1963: During September 1963, 23,247 tons of fish meal and 19.8 million pounds of oil were produced in the United States. Compared with the same month in 1962, this was a decrease of 8,465 tons or

| U. S. Production of Fish Meal, Oil, and Solubles, September 1963 ^{1/} with Comparisons | | | | | |
|--|---------------|---------------|----------------|----------------|----------------|
| Product | September | | Jan. -Sept. | | Total 1962 |
| | 1/1963 | 1962 | 1/1963 | 1962 | |
| (Short Tons) | | | | | |
| Fish Meal and Scrap: | | | | | |
| Herring | 1,296 | 737 | 6,459 | 4,548 | 5,095 |
| Menhaden 2/ | 18,563 | 27,285 | 153,748 | 198,972 | 238,680 |
| Sardine, Pacific | 7 | 8 | 16 | 673 | 702 |
| Tuna and mackerel | 2,089 | 1,368 | 16,058 | 20,595 | 26,559 |
| Unclassified | 1,292 | 2,314 | 17,781 | 24,802 | 27,297 |
| Total | 23,247 | 31,712 | 194,062 | 249,590 | 298,333 |
| Shellfish, marine-animal meal and scrap . | 3/ | 3/ | 3/ | 3/ | 12,899 |
| Grand total meal and scrap | 3/ | 3/ | 3/ | 3/ | 311,232 |
| Fish Solubles: | | | | | |
| Menhaden | 8,272 | 10,091 | 63,638 | 71,460 | 84,885 |
| Other | 1,204 | 2,197 | 13,296 | 22,483 | 28,353 |
| Total | 9,476 | 12,288 | 76,934 | 93,943 | 113,238 |
| Homogenized condensed fish | 90 | 700 | 7,224 | 9,570 | 11,096 |
| (1,000 Pounds) | | | | | |
| Oil, Body: | | | | | |
| Herring | 196 | 642 | 4,868 | 4,759 | 5,255 |
| Menhaden 2/ | 18,144 | 29,611 | 138,230 | 192,203 | 237,815 |
| Sardine, Pacific | 2 | 6 | 2 | 164 | 167 |
| Tuna and mackerel | 842 | 513 | 3,695 | 3,841 | 5,175 |
| Other (including whale) | 639 | 425 | 6,951 | 6,918 | 7,396 |
| Total oil | 19,823 | 31,197 | 153,746 | 207,885 | 255,808 |
| ^{1/} Preliminary data. ^{2/} Includes a small quantity of thread herring. ^{3/} Not available on a monthly basis. Note: Beginning with February 1963, fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon. | | | | | |



27 percent in meal and scrap production, and approximately 11.4 million pounds or 36 percent less in oil production.

Menhaden meal showed a decrease of 8,722 tons or 32 percent, while menhaden oil (18.1 million pounds) was 39 percent less than in September 1962.

A total of 9,476 tons of fish solubles was manufactured in September 1963--a decrease of 23 percent as compared with the same month in 1962. Production of homogenized condensed fish amounted to 90 tons--a decrease of 610 tons or 87 percent less than in September 1962.

The quantity of fish meal processed during the first 9 months of 1963 amounted to 194,062 tons--55,528 tons less than in the same period

in 1962. Fish solubles and homogenized fish production totaled 84,158 tons--a decrease of 19,355 tons. The January-September production of marine animal oil amounted to 153.7 million pounds--54.1 million pounds less than during the same period of 1962.

Major Indicators for U.S. Supply, October 1963: United States production of fish meal and fish oil in October 1963 was lower by 51.2 and 64.7 percent, respectively, as compared

| Item and Period | 1963 | 1962 | 1961 | 1960 | 1959 |
|-----------------------------------|---------|---------|---------|---------|---------|
| (Short Tons) | | | | | |
| Fish Meal: | | | | | |
| Production 1/: | | | | | |
| December | - | 2,349 | 12,750 | 9,185 | 14,381 |
| November | - | 11,023 | 10,058 | 8,725 | 10,797 |
| October | 17,861 | 36,614 | 16,852 | 24,455 | 22,026 |
| Jan.-Sept. | 194,062 | 249,590 | 257,399 | 232,583 | 227,843 |
| Jan.-Dec. prelim. totals 2/ | - | 288,336 | 289,039 | 257,969 | 275,396 |
| Jan.-Dec. final tot. | - | 311,232 | 311,265 | 290,137 | 306,551 |
| Imports: | | | | | |
| December | - | 18,977 | 23,268 | 15,564 | 5,538 |
| November | - | 11,904 | 25,649 | 6,149 | 3,673 |
| October | - | 12,732 | 9,425 | 12,515 | 3,821 |
| Jan.-Sept. | 303,810 | 208,694 | 159,140 | 97,333 | 120,643 |
| Jan.-Dec. totals .. | - | 252,307 | 217,845 | 131,561 | 133,955 |
| Fish Solubles: | | | | | |
| Production 3/: | | | | | |
| December | - | 1,613 | 4,606 | 3,574 | 5,039 |
| November | - | 4,147 | 5,153 | 2,891 | 5,451 |
| October | 7,759 | 15,010 | 8,418 | 11,139 | 13,946 |
| Jan.-Sept. | 84,158 | 103,513 | 90,841 | 88,757 | 152,477 |
| Jan.-Dec. prelim. totals | - | 120,886 | 109,018 | 106,361 | 176,913 |
| Jan.-Dec. final tot. | - | 124,334 | 112,241 | 98,929 | 165,359 |
| Imports: | | | | | |
| December | - | 387 | 472 | 60 | 420 |
| November | - | 435 | 3,649 | 282 | 3,089 |
| October | - | 290 | 110 | - | 1,908 |
| Jan.-Sept. | 2,994 | 5,196 | 2,508 | 2,832 | 21,213 |
| Jan.-Dec. totals .. | - | 6,308 | 6,739 | 3,174 | 26,630 |
| (1,000 Pounds) 5/ | | | | | |
| Fish Oils: | | | | | |
| Production: | | | | | |
| December | - | 605 | 11,532 | 8,041 | 14,457 |
| November | - | 7,956 | 10,539 | 9,315 | 8,887 |
| October | 13,980 | 39,563 | 14,734 | 23,439 | 16,866 |
| Jan.-Sept. | 153,746 | 207,885 | 221,568 | 163,045 | 146,611 |
| Jan.-Dec. prelim. totals 4/ | - | 257,131 | 259,400 | 206,848 | 189,240 |
| Jan.-Dec. final tot. | - | 255,808 | 266,670 | 215,861 | 193,324 |
| Exports: | | | | | |
| December | - | 172 | 10,484 | 15,807 | 19,586 |
| November | - | 171 | 1,425 | 14,640 | 6,096 |
| October | - | 26,003 | 15,202 | 4,434 | 14,331 |
| Jan.-Sept. | 187,012 | 96,624 | 95,373 | 108,795 | 104,470 |
| Jan.-Dec. totals .. | - | 123,050 | 122,486 | 143,659 | 144,481 |

1/Does not include crab meat, shrimp, and misc. meals.
 2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 90 percent for 1959, 89 percent for 1960, 93 percent for 1961 and 1962.
 3/Includes homogenized fish.
 4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.
 5/Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.
 Note: Data for 1963 are preliminary.

with October 1962. Fish solubles production was down 48.3 percent.

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-September 1963: Based on domestic production and imports, the United States available supply of fish meal for January-September 1963 amounted to 497,872 short tons--39,588 tons (or 8.6 percent) more than during the same period in 1962. Domestic production was 55,528 tons (or 22.2 percent) less, but imports were 95,116 tons (or 45.6 percent) higher than in the same period in 1962. Peru continued to lead other countries with shipments of 231,210 tons.

The United States supply of fish solubles (including homogenized fish) during January-September 1963 amounted to 87,152 tons--a decrease of 21,557 tons as compared with the same period in 1962. Domestic production and imports dropped 18.7 percent and 42.4 percent, respectively.

| Item | Jan.-Sept. | | Total 1962 |
|--|----------------|----------------|----------------|
| | 1/1963 | 1962 | |
| (Short Tons) | | | |
| Fish Meal and Scrap: | | | |
| Domestic production: | | | |
| Menhaden | 153,748 | 198,972 | 238,680 |
| Tuna and mackerel | 16,058 | 20,595 | 26,559 |
| Herring | 6,459 | 4,548 | 5,095 |
| Other | 17,797 | 25,475 | 40,898 |
| Total production | 194,062 | 249,590 | 311,232 |
| Imports: | | | |
| Canada | 39,535 | 33,738 | 42,806 |
| Peru | 231,210 | 156,111 | 186,249 |
| Chile | 22,637 | 8,255 | 9,247 |
| So. Africa Republic | 7,241 | 9,584 | 10,084 |
| Other countries | 3,187 | 1,006 | 3,921 |
| Total imports | 303,810 | 208,694 | 252,307 |
| Available fish meal supply | 497,872 | 458,284 | 563,539 |
| Fish Solubles: | | | |
| Domestic production 2/ | | | |
| | 84,158 | 103,513 | 124,334 |
| Imports: | | | |
| Canada | 1,624 | 1,196 | 1,335 |
| Iceland | - | 2,205 | 2,332 |
| So. Africa Republic | 191 | 1,192 | 1,717 |
| Other countries | 1,179 | 603 | 924 |
| Total imports | 2,994 | 5,196 | 6,308 |
| Available fish solubles supply .. | 87,152 | 108,709 | 130,642 |

1/Preliminary.
 2/50-percent solids. Includes production of homogenized condensed fish.

REVIEW OF TRENDS IN THE USE OF FISH MEAL IN TEXAS AREA:

In October 1963, the animal nutritionist attached to the U. S. Bureau of Commercial Fisheries' Technical Advisory Unit, at Boston Mass., attended the 18th Annual Texas Nutrition Conference and visited mixed feed pro-

ducers and experiment station scientists in Texas and areas in Arkansas and Louisiana bordering Texas. His observations were as follows:

Levels of fish meal utilization in the area visited vary in two different ways, according to nutritionists formulating rations for production by large firms. First of all there is a regional variation, the levels of utilization being relatively higher in the western part of Texas than in the eastern part of the State and in areas adjoining States located near the Texas border. For example, 5 percent fish meal vs. 2.5 percent in chick starter rations and 2 percent vs. 0.5 percent fish meal in laying rations are typical levels found in rations liberally supplied as compared with others less liberally supplied with the meal. The second variation in rate of utilization is related to the use to which the feed is to be put; relatively low levels of fish meal are found in rations produced for sale under brand names in order to cut costs and enable producers to compete with other manufacturers. However, relatively liberal levels often appear in custom mixed rations because the buyers specify such levels of fish meal.

Workers at the Texas A. and M. Experiment Station are now, and have long been, actively engaged in research on the value of industrial fish products in poultry and livestock feeding. More recently, active research on fish product utilization has been initiated at the substations at Gonzales and Lubbock. At the former station, work on fish product utilization in poultry rations is carried out, whereas at the latter an experiment in which menhaden oil is fed to young cattle at a level equal to 2 percent of the ration has been in progress. Workers at both stations plan to continue their research on fish products. At Lubbock, the value of fish oil in dry lot cattle feeding and the values of fish meal and other fish products in the nutrition of sheep will be studied. The plan for the sheep research is based upon the findings of a practical Scottish agriculturist who recently reported beneficial effects of fish meal on sheep.

At the Texas Nutrition Conference, evidence of the nutritional values of fish products was offered by a number of speakers. They reported that, in a study of feed requirements of broiler hens, fish meal increased both hatchability and fertility of eggs. Another report, described the results of feeding fish meal as follows: "A significant improve-

ment in feed conversion was observed each time the fish meal was substituted in the broiler feed formulas either at the 2.5 or 5 percent levels and in the presence of either 2.5 or 5 percent poultry oil." The speaker postulated that the improvement was due in large part to the presence of unidentified growth factors (UGF) in the meals.

A scientist from Chicago, Ill., stated that unidentified growth factors "are needed in poultry, beef, and swine nutrition, and in many instances can be the deciding factor between success and failure of an enterprise." The speaker presented evidence that UGF protects swine from gastric ulcers. In addition, he reported that feed efficiency of broilers during a 9-week period was greater on rations containing 3 percent fish meal than on similar rations containing 1 percent fermentation product.

Speakers from the Texas A. and M. University, presented results of an experiment that showed fish meal to be a necessary ingredient of an economical ration for swine. Ordinary (not degossypolized) cottonseed meal was fed swine with and without iron salts and with and without fish meal. A ration containing 7 percent fish meal with iron salts resulted in the highest rate of gain and greatest feed efficiency when comparisons were made with rations (1) lacking fish meal, (2) containing 4.3 percent fish meal, and (3) containing meat scraps as a substitute for fish meal. This finding is of commercial importance in the southern states where cottonseed meal is the least expensive protein concentrate available. However, untreated cottonseed meal contains gossypol which is toxic to swine, and for this reason cottonseed meal ordinarily has not been used in mixed feeds for swine. The Texas finding paves the way for the production of economical rations for swine in the southern states using cottonseed meal as an economical source of protein together with an iron salt and fish meal--the latter is an essential part of the ration. (Technical Advisory Unit, Boston, Mass., November 7, 1963.)



Irradiation Preservation

COMPARATIVE TESTS MADE WITH IRRADIATED FILLETS AND FRESH CONTROLS:

As part of the research on the irradiation of seafoods under way at the Gloucester Tech-

nological Laboratory of the U. S. Bureau of Commercial Fisheries, large scale acceptability tests were conducted in November 1963 at Fort Lee, Va. Chemists from the Bureau's Laboratory supervised the preparation of samples of irradiated haddock fillets for use in the tests with troops at Fort Lee.

The irradiated haddock fillets were fed to 300 soldiers, and an equal number were served fresh controls. Following the tests the soldiers completed score sheets to indicate their preferences. The results were to be analyzed statistically and evaluated to determine overall preference.



Maine Sardines

CANNED STOCKS, NOVEMBER 1, 1963:

Canners' stocks of Maine sardines on Nov. 1, 1963, were 93,000 cases less than the 1,348,000 cases on hand Nov. 1, 1962, but were 1,034,000 cases above stocks on hand two years ago on Nov. 1, 1961 (the pack for the 1961 season was unusually small). Distributors' stocks of 308,000 cases of canned Maine sardines were up 34.0 percent from the 230,000 cases on hand Nov. 1, 1962, and up 52.5 percent from the 202,000 cases on hand Nov. 1, 1961.

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, November 1, 1963, with Comparisons

| Type | Unit | 11/1/63 | 11/1/62 | 11/1/61 |
|--------------------|---------------|-----------|-----------|---------|
| Distributors . . . | actual cases | 308,000 | 230,000 | 202,000 |
| Canners | std. cases 1/ | 1,255,000 | 1,348,000 | 221,000 |

1/100 3½-oz. cans equal one standard case.
Source: "U. S. Bureau of the Census, 'Estimates of Distributors' and Canners' Stocks--Nov. 1, 1963.'"

The 1963 season pack totaled about 1,500,000 standard cases on Nov. 1, 1963, when the pack was virtually complete, according to the Maine Sardine Council. On April 15, 1963, carryover stocks at the canners' level amounted to about 660,000 cases. Adding the pack as of Nov. 1, 1963, results in a total supply of 2,160,000 cases as of that date--up 2.6 percent from the total supply of 2,106,100 cases reported Nov. 1, 1962, and higher by 98.7 percent from the short supply of 1,087,000 cases as of Nov. 1, 1961.

Table 2 - Canned Maine Sardines--Season Supply as of November 1, 1963, with Comparisons

| Item | 1963 | 1962 | 1961 |
|--|-----------|-----------|-----------|
| Canners' carryover stocks on April 15 2/ | 660,000 | 33,000 | 457,000 |
| Season pack to Nov. 1 2/ | 1,500,000 | 2,073,100 | 630,000 |
| Total supply as of Nov. 1, | 2,160,000 | 2,106,100 | 1,087,000 |

1/100 3½-oz. cans equal one standard case.
2/The usual legal packing season in Maine, extending from April 15 to Dec. 1, was in effect during the 1961 and 1963 season. The 1962 season was extended to 13 months--Dec. 2, 1961-Jan. 1, 1963--but the 1962 pack canned before April 15 was insignificant.

Note: Beginning with the Canned Food Report of April 1, 1963, U. S. Bureau of the Census estimates of distributors' stocks were based on a revised sample of merchant wholesalers and warehouses of retail multiunit organizations. The revised sample resulted in better coverage. The January 1, 1963, survey was conducted with both samples to provide an approximate measure of the difference in the two samples. That survey showed that the estimate of distributors' stocks of canned Maine sardines from the revised sample was 13 percent above that given by the old samples.
Source: U. S. Bureau of the Census, Canned Food Report, Nov. 1, 1963.



Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, WINTER 1963/64:

It is expected that total United States catch of fishery products during 1963 will be somewhat lower than a year earlier. During the first 8 months in 1963, total landings were down about 13 percent from a year earlier. However, cold-storage holdings of edible fishery products on October 1, 1963, were 224 million pounds, about 17 million larger than on the same date in 1962. The last few months of 1963 is a season of normal decline for landings of fish and shellfish.

Imports of edible fish through August 1963 were down about 6 percent from a year earlier. There was a 2.2 percent decrease in value of imports. Sharp decreases occurred in imports of canned tuna in brine, canned salmon, canned sardines in oil, and frozen tuna. Increases occurred in canned sardines not in oil, frozen shrimp, ocean perch fillets, fresh swordfish, and canned crab meat. Continued decrease in total imports was expected for the remainder of 1963.

Wholesale fish prices in September 1963 were almost 11 percent lower than a year earlier. Retail prices were down only slightly. But there were sharp decreases in prices for fresh and frozen shrimp and for most canned fish products. During the latter part of 1963, prices were expected to remain about stable.

Per capita consumption during the winter months of 1963/64 probably will be down from a year earlier.

This analysis was prepared by the Bureau of Commercial Fisheries, Fish and Wildlife Service, U. S. Department of the Interior, and published in the Department of Agriculture's November 1963 issue of The National Food Situation (NFS-106).



Michigan

LAKE TROUT STOCKING PROGRAM CONTINUED IN FALL 1963:

Plantings of about 300,000 lake trout were made in 15 northern Michigan lakes by the Michigan Conservation Department in the fall of 1963.

The plantings, made up of about 260,000 fingerlings and 40,000 keeper-sized fish, were carried out as part of a continuous program to maintain lake trout numbers in inland waters where there is virtually no natural reproduction by these fish.

The releases of fingerlings totaled 100,000 in Lake Michigamme; 10,000 in Little Oxbow Lake; 50,000 each in Golden and Smokey Lakes; and 50,000 in Walloon Lake.

Plantings of legal-sized lake trout included 5,000 in Glen Lake; 1,245 in Grand Sable Lake; 100 and 1,000 in Tilden and Squaw Lakes; 2,500 in Lake Bellaire; 3,000 each in Chicago and Golden Lakes; 10,000 and 5,000 in Elk and Torch Lakes; and 9,300 in Higgins Lake.

Another 55,775 legal and sublegal lake trout were released in the spring of 1963 in Crystal Lake, Walloon Lake, Golden and Chicago Lakes, Tilden and Squaw Lakes, and Lake Avalon.

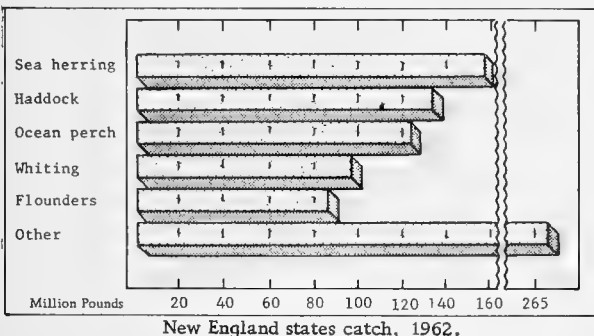


New England

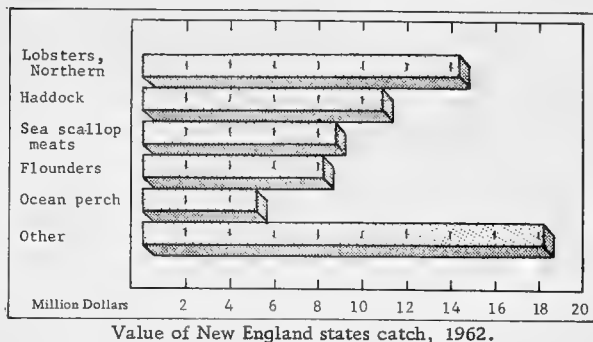
FISHERIES, 1962:

Fish and shellfish landings in the New England States (Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut) during 1962 amounted to 872 million pounds valued at \$66 million ex-vessel. Compared with 1961, this was an increase of 112 million pounds (15 percent) and \$5 million (8 percent).

The gain in production resulted chiefly from sea herring landings of 158 million pounds--up 100 million over 1961. There was a considerable increase in the catch of yellowtail flounders. Landings of cod, whiting, and lobsters also showed improvement com-



pared with 1961. These increases, however, were partially offset by reduced landings of ocean perch, pollock, and sea scallops.



The 1962 Maine landings of 294 million pounds and Massachusetts landings of 493 million increased about 96 million pounds and 23 million pounds, respectively, compared with 1961. Rhode Island production in 1962 totaled nearly 77 million pounds--a decline of 7 million. Landings in New Hampshire (1 million pounds) and Connecticut (6 million pounds) remained much the same as in 1961.

There were 21,549 fishermen engaged in the New England fisheries in 1962--about 188 less than in 1961. This decrease occurred in the vessel fishery and in the number of regular fishermen employed in the shore and boat fisheries. The latter fishery showed an increase of 265 casual fishermen compared with 1961. Fishing craft operated in the New England area during the year consisted of 729 vessels totaling 45,839 gross tons, 10,414 motor boats, and 699 other boats.



North Atlantic Fisheries

Exploration and Gear Research

ELECTRICAL TRAWLING TESTS CONTINUED:

M/V "Delaware" Cruise 63-9 (September 28-October 10, 1963 and October 15-24, 1963): To continue to test and evaluate the effect of an electric field upon the catch of a commercial otter-trawl net when the field is used as an adjunct to the net, was the main purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The electrical system was designed primarily to immobilize fish in the path of the advancing trawl. The equipment

used was similar to that tested during Delaware Cruise 62-9 (July 11-August 24, 1962).

The earlier trials were made to compare the electrical trawl with a non-electrical trawl as to quantitative fish-catching capability. The most recent electrical fishing tests were made to determine whether or not size selectivity of the individual fish in the catches could be achieved by adjusting the characteristics of the electric pulses fed into the water.

No clear cut fish-size selectivity was discernible as a result of the pulse frequencies and the electrode arrangement tested during Cruise 63-9. The output frequencies tested were 10 and 40 pulses per second from two net transformers which were fired alternately. (A single anode and cathode were connected to each transformer secondary.) The similarity of results from fishing with those frequencies indicate the possibility of an overlapping of the effective fields. If that was the case, the number of pulses per second in the overlapped field space would have been doubled. This could have obscured the possible effect of the lower pulse frequency. A modification of the equipment to provide a pure pulse frequency throughout the field is planned for the next scheduled electro-trawling trials in February 1964.

The conductor towing warps used during the cruise were comprised of an insulated single conductor made of copper (located at the center of the cable) with two outer, non-insulated, layers of stranded steel wire for strength. The steel wire was successfully used as the electrical return from the net transformers. This wire, however, was subject to bruising, and easy rupture of the conductor insulation was the result. A more mechanically suitable system, such as an adequately designed third wire and winch, may ultimately be required.

Fishing was conducted with a No. 41 large mesh ($4\frac{1}{2}$ -inch internal measurement), manila net. After the first few days of fishing the large mesh cod end was replaced with a $2\frac{1}{2}$ -inch cod end for the collection of smaller fish. No consistent differences were found between the size selectivity of 10 and 40 pulses per second when taking either large or small fish. Note: See Commercial Fisheries Review, November 1962 p. 31.



North Pacific Exploratory Fishery Program

PELAGIC TRAWL TESTED FOR EFFECTIVENESS IN CATCHING WINTER HERRING:

M/V "Yaquina" Cruise 1 (November 6-24, 1963): The primary objectives of this cruise by the U. S. Bureau of Commercial Fisheries chartered exploratory fishing vessel Yaquina were to: (1) evaluate the catching effectiveness of a modified Cobb pelagic trawl in capturing winter herring; (2) determine net efficiency and behavior characteristics relative to the capture of winter herring; and (3) evaluate the utility of the chartered vessel Yaquina for fishing gear research. Tests and trials were conducted in the San Juan Islands, Strait of Georgia, and Bellingham Bay areas of Puget Sound.

Extensive soundings were made throughout the cruise area, but concentrations of herring were found only in the Bellingham Bay-Eliza Island area. Several 1-hour hauls in that area yielded herring in excess of 2,000 pounds. But no catches exceeded 3,000 pounds, although commercial seine fishermen in the immediate vicinity captured quantities up to 40 tons or more a set.

A total of 600 pounds of large herring were collected for radiation studies.

Underwater observations by SCUBA - equipped divers pointed up the need for additional net modifications. Small-mesh liners were installed in the intermediate and cod-end sections, and a small-mesh fyke was installed in the forward section of the cod end. The modifications resulted in only slight improvement in the catches.

Through the courtesy of a fish company in Seattle, Wash., the M/V Paragon assisted in a single attempt to tow the Cobb pelagic trawl with two vessels. A one-ton herring catch was made even though little indication of fish was noted on the echo-sounder.

Five tows were made with a British Columbia-type midwater herring trawl to furnish a measure of relative effectiveness for the Cobb pelagic trawl.

* * * * *

SCALLOP RESOURCES OFF COAST OF OREGON SURVEYED:

M/V "John N. Cobb" Cruise 62 (September 30-November 22, 1963): The principal ob-

jective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb was to locate and delineate the scallop resources along the Oregon coast.

The regions surveyed during this cruise were the areas from Cape Arago to Newport, Oreg., and from the Columbia River lightship to Cape Falcon, Oreg.

A total of 126 drags were made in water depths ranging from 30 to 70 fathoms. The best catches in the area from Cape Arago to Newport occurred off the Siuslaw River in depths of 45 to 55 fathoms. These catches ranged up to 175 scallops (1½ bushels) per one-half hour drag. The eastern otter trawl was also fished and the resultant catches were not as large. The incidental trawl fish catch was quite large and therefore the use of this gear was less desirable. In the area from the Columbia River to Cape Falcon the best catches occurred off Tillamook Head in 50 to 55 fathoms of water. The catches ranged up to 635 scallops (4 bushels) per half-hour tow. Night and day comparison drags were made with no difference in the scallop catches.

Due to the extreme weather conditions encountered, the area from Newport, Oreg., to Cape Falcon could not be surveyed as was planned.

Approximately 400 pounds of fresh scallops were delivered to the Oregon State University Seafood Laboratory at Astoria, Oreg., for a meat yield study.

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SURVEY OF DEEP-WATER MARINE FAUNA OFF MOUTH OF COLUMBIA RIVER CONTINUED:

M/V "Commando" Cruise 12: The 12th in a series of cruises designed to monitor deep-water marine fauna at stations established along a trackline southwest of the mouth of the Columbia River was completed November 14, 1963, by the U. S. Bureau of Commercial Fisheries chartered research vessel Commando. The cruise was conducted in cooperation with the Atomic Energy Commission.

Inclement weather restricted fishing to 1 day, during which a 30-minute tow was made at 50 fathoms and a 1-hour tow at 100 fathoms. A 400-mesh otter trawl was used.

Commercial species of fish taken during trawling included Dover sole (Microstomus pacificus), rex sole (Glyptocephalus zachirus), petrale sole (Eopsetta jordani), English sole (Parophrys vetulus), sablefish (Anoplopoma fimbria), ocean perch (Sebastes alutus), lingcod (Ophiodon elongatus), and halibut (Hippoglossus stenolepis). The most abundant species in the catches were rex sole (1,200 pounds) from 50 fathoms and Dover sole (1,500 pounds) from 100 fathoms. Other catches included 50 pounds of petrale sole and 150 pounds of English sole from 50 fathoms, and 200 pounds of sablefish and 400 pounds of ocean perch from 100 fathoms.

Small quantities of Dungeness crab (Cancer magister) and pink shrimp (Pandalus jordani) were found.

Samples of fish were collected and delivered to the Laboratory of Radiation Biology, University of Washington, for radiological analysis.

The cooperative program with the Oregon Fish Commission to study the migrations of Dover sole and sablefish was continued with the tagging of 99 Dover sole and 13 sablefish. Note: See Commercial Fisheries Review, November 1963 p. 40.



Oceanography

ADDRESS TO THE NATIONAL ACADEMY OF SCIENCES BY THE LATE PRESIDENT KENNEDY:

The late President Kennedy on October 22, 1963, addressed the centennial convocation of the National Academy of Sciences, held in Washington, D. C. The following excerpts from his speech are of particular interest to oceanographers:

"I recently sent to Congress a plan for a national attack on the oceans of the world, calling for the expenditure of more than \$2 billion over the next ten years. This plan is the culmination of three years' effort by the Inter-Agency Committee on Oceanography, and it results from recommendations made by the National Academy.

"Our goal is to investigate the world ocean, its boundaries, its properties, its processes. To a surprising extent, the sea has remained a mystery. Ten thousand fleets still sweep



The late President John F. Kennedy.

over it in vain. We know less of the oceans at our feet, where we came from, than we do of the sky above our heads. It is time to change this, to use to the full our powerful new instruments of oceanic exploration, to drive back the frontiers of the unknown in the waters which encircle our globe.

"I can imagine no field among all those which are so exciting today than this great effort which our country and others will carry on in the years to come. We need this knowledge for its own sake. We want to know what is under the sea, and we need it to consider its bearings on our security, and on the world's social and economic needs. It has been estimated, for example, that the yield of food from the seas could be increased five or ten times through better knowledge of marine biology, and some day we will seed and weed and harvest the ocean. Here, again, the job can best be done by the nations of the world working together in international institutions.

"As all men breathe the same air, so a storm along Cape Cod may well begin off the shores of Japan. The world ocean is also indivisible, and events in one part of the great sea have astonishing effects in remote places.

"International scientific cooperation is indispensable if human knowledge of the ocean is to keep pace with human needs. . . .

"If science is to press ahead in the four fields (natural resources, oceanography, meteorology, environmental controls) that I have mentioned, if it is to continue to grow in effectiveness and productivity, our society must provide scientific inquiry the necessary means of sustenance. We must, in short, support it.

Military and space needs, for example, offer little justification for much work in what Joseph Henry called abstract science. Though such fundamental inquiry is essential to the future technological vitality of industry and Government alike, it is usually more difficult to comprehend than applied activity, and, as a consequence, often seems harder to justify to the Congress, to the Executive Branch, and to the people. . . .

"Science has made all of our lives so much easier and happier in the last 30 years. I hope that the people of the United States will continue to sustain all of you in your work and make it possible for us to encourage other gifted young men and women to move into these high fields which require so much from them and which has so much to give to all of our people. So the need is very great. Even though some of your experiments may not bring fruition right away, I hope that they will be carried out immediately.

"It reminds us of what the great French Marshal Lyautey once said to his gardener: 'Plant a tree tomorrow.' And the gardener said, 'It won't bear fruit for a hundred years.' 'In that case,' Lyautey said to the gardener, 'plant it this afternoon.' That is how I feel about your work."

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COMMITTEE FOR SCIENTIFIC EXPLORATION OF THE ATLANTIC SHELF:

The Committee for the Scientific Exploration of the Atlantic Shelf (SEAS) held its winter meeting on December 12-13, 1963, in Washington, D. C. The SEAS Committee membership is comprised of marine biologists, physical and chemical oceanographers, geological oceanographers, and marine meteorologists who are conducting research operations on the Atlantic shelf environment.

The role of the SEAS Committee has been outlined as follows: (1) To emphasize the importance of the Atlantic shelf and stimulate interest in its oceanography; (2) to intensify observations of the shelf environment--physical, chemical, geological, and biological; (3) to provide the nucleus for the development of integrated large-scale marine research efforts; (4) to foster systems for continuous collection and compilation of environmental data; (5) to foster efficient means for the exchange of data currently collected by all laboratories; (6) to provide a sounding board for

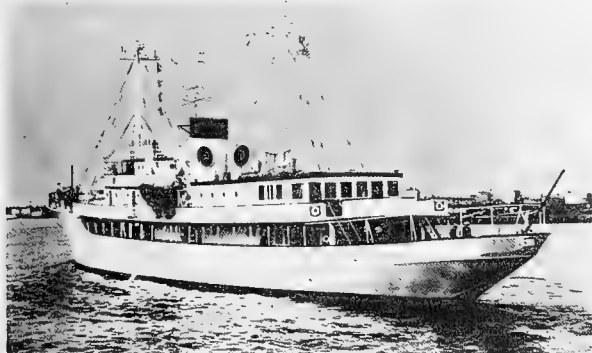
development of new equipment and techniques; and (7) to provide an opportunity for regular exchange of ideas and for growth of community opinion on environmental research. (National Oceanographic Data Center, Newsletter, October 31, 1963.)

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HONOLULU LABORATORY VESSEL FINISHES FIRST PHASE OF INDIAN OCEAN SURVEY:

M/V "Anton Bruun" Cruise 2 (May 22-July 23, 1963): Halfway around the world from their home base, the Biological Laboratory at Honolulu, scientists, and fishermen of the U. S. Bureau of Commercial Fisheries have been engaged in a study of the high-seas fishery resources and oceanography of the Indian Ocean. According to the Bureau's Hawaii Area Director, this far-flung research project is part of a larger effort in which the marine scientists of many countries have joined forces in a concerted study of the waters, the living inhabitants, the weather, and the submarine geology of the least-known of the world's oceans. The Honolulu Laboratory was selected to carry out the United States' fishery research portion of this program because of the extensive experience which its staff has accumulated in the investigation of tunas and other open-sea fishes and their environments in the tropical Pacific. From what was known of the Indian Ocean, it was expected that the tunas and spearfishes would also figure prominently in the fishery picture there.

The first tuna fishing cruise under the program was Cruise 2 of the research vessel Anton Bruun. This vessel (formerly the Presidential yacht Williamsburg) is being used as a floating laboratory for the United States biological studies in the Indian Ocean. Although the Anton Bruun is much larger than most



Research vessel Anton Bruun (formerly the Presidential yacht Williamsburg).

tuna fishing boats, and was not designed for such utilitarian employment, a fishery research biologist at the Honolulu Laboratory, and Chief Scientist of Cruise 2, managed to work out modifications that made it possible to fish successfully with tuna long lines from the ship.

This cruise began May 22, 1963, at Bombay, India, and was completed with the vessel's return to that port on July 23. This period was chosen for sampling fish distribution and environmental conditions during the southwest monsoon, when the prevailing wind is from the southwest, one of the two sharply contrasting seasons of the Indian Ocean area. The Indian Ocean is the only major body of water in the world which is under the influence of two "trade wind" systems from one season to the next. This fact makes environmental studies of this kind very important. Studies of this type could greatly increase our understanding of the effect of a changing environment on oceanic food resources. Two scientists and five Honolulu fishermen carried out sampling of the fish populations at 33 locations on two lines running north and south across the Equator at 70 and 80 degrees E. long., south of the tip of the Indian peninsula. At each location, 240 baited hooks were set 200 to 300 feet below the surface of the sea. This fishing was paralleled by measurement of sea temperatures and sampling of the ocean water at depths down to 6,000 feet and collection of various small living forms associated with the larger fishes of the surface layers.

The main components of the catches were yellowfin and albacore tuna, along with big-eye tuna, marlin and sailfish, and sharks of a number of species. The best tuna catch of the cruise was made slightly north of the Equator in the vicinity of the Maldive Islands, where 44 yellowfin were taken in one day, for an unusually high catch rate of 18.4 fish per 100 hooks.

Distribution of the long-line catches, when compared with distribution of the ocean water types encountered on the cruise, showed that albacore were caught only in the South Indian Ocean Central type of water, while the other tunas--yellowfin, bigeye, and skipjack-- were taken throughout this water type as well as in the Equatorial water type and along the southern edge of the Arabian Sea water. The marlins were associated in general with the Arabian Sea and Equatorial waters, while the great

blue shark, like the albacore, was found only in the South Indian Ocean Central water.

Plans have been made at the Laboratory for the second long-line fishing cruise of the Anton Bruun, to sample conditions during the northeast monsoon season, from January through March 1964. This cruise will provide important material for comparing seasonal changes in the abundance of the large, open-sea fishes and in the distribution of the water types in which they live.

Data on the catches of the Anton Bruun and of the Japanese commercial tuna vessels fishing in the Indian Ocean will be combined with the oceanographic data collected by all ships participating in the International Indian Ocean Expedition in a joint study by scientists from the Honolulu Laboratory and the Nankai Regional Fisheries Research Laboratory, Kochi, Japan. This study should lead to an understanding of the relationship between the distribution and abundance of the tunas and billfishes and the ocean current systems of the Indian Ocean. (U.S. Bureau of Commercial Fisheries, Biological Laboratory at Honolulu, Scientific News Notes, October 1963.)

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INDIAN OCEAN EXPLORATIONS BY THE "ATLANTIS II" COMPLETED:

The Woods Hole Oceanographic Institution research vessel Atlantis II was one of the major United States vessels participating in the wide-ranging International Indian Ocean Expedition, involving some 25 countries and 44 vessels. The Atlantis II, which left its home port in July 1963, completed its observations in November and returned to Woods Hole, Mass., late in December 1963. Although a wide variety of observations were made during the cruise, the main task of the Atlantis II was to obtain data on the physical movements of the water in the western half of the Indian Ocean.

The chief scientist on the Atlantis II during the cruise said, "It's far too early to generalize on our findings, but we have learned that it is a very complex ocean, and we did accomplish what we set out to do. . . to get a comprehensive view of the Indian Ocean during one of the monsoon seasons."

The important Somali Current, which sweeps up the eastern coast of Africa at a speed in excess of four knots, was revealed

to be considerably wider and deeper than previously supposed. The Atlantis II scientists measured it to be some 150 miles wide and 1,000 meters deep, with the total water transport about one-fifth that of the great Gulf Stream off the east coast of the United States.

The area of the Somali Current also has a considerable upwelling of colder water and nutrients from the bottom. In air temperatures of 32.2° C. (90° F.), surface temperatures of the stream were recorded at around 15.6° C. (60° F.). They might be expected to be about 27° C. (80.6° F.) without the influence of the stream. Just to the east of the Somali Current, there appears to be a more shallow counter current running southward; with another northward current just to the east of it.

Another interesting feature of the cruise of the Atlantis II was the relatively slight rainfall encountered. July to September is the traditional rainy season on the continent of India with the prevailing winds sweeping generally to the northeast from the ocean. At sea, however, the rainfall was quite slight during the entire cruise.

As could be expected, the data collected raised many questions. For instance, why is the Arabian Sea so rich in nutrients? What causes the complex water movements observed? What is the reason for the double oxygen minimum layer found all over the area? And does the relatively less saline water found in certain places imply a closed circulatory system involving both meteorological and oceanographic phenomena?

Techniques applied in the collection of data included the use of drift bottles for surface current measurements, as well as other devices that were tracked near the bottom and at middle depths. The important upper layers of the ocean waters were analyzed for temperature and salinity, and temperatures down to around 100 fathoms were measured by the bathythermograph while the ship was underway. The temperature structure of deeper waters, along with water samples for analysis, were obtained by lowering Nansen bottles at spaced intervals on steel cables.

A program of meteorological investigations was conducted in cooperation with the U. S. Weather Bureau. Radio-sonde observations were made daily. Also, the phenomena of evaporation, precipitation, solar radiation, humidity, and other meteorological factors were measured aboard ship.

In addition, technicians conducted a program of continuous echo-sounding to chart the bottom configuration of the areas covered. Some biological data were obtained to study the effects of the monsoon winds on the productivity of the waters. Other investigations involved an experimental radio navigation system, computations of the wave power spectra, rain water chemistry, and measurements of magnetic fields.

Starting from Bombay, India, the Atlantis II criss-crossed the western half of the Indian Ocean working its way south. Its major ports of call were Colombo, Ceylon; Zanzibar, Tanganyika; Seychelles Islands; Diego Suarez, Madagascar; Port Luis, Mauritius and Lourenco Marques, Mozambique.

The Atlantis II is scheduled to return to the Indian Ocean in 1965 for additional observations. Other Woods Hole Oceanographic Institution participation in the International Indian Ocean Expedition includes meteorological observations by scientists from a four-engine aircraft, and a cruise to the area early in 1964 by the research vessel Chain, principally for geophysical studies.

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NEW RESEARCH VESSEL TO BE ACQUIRED BY DUKE UNIVERSITY:

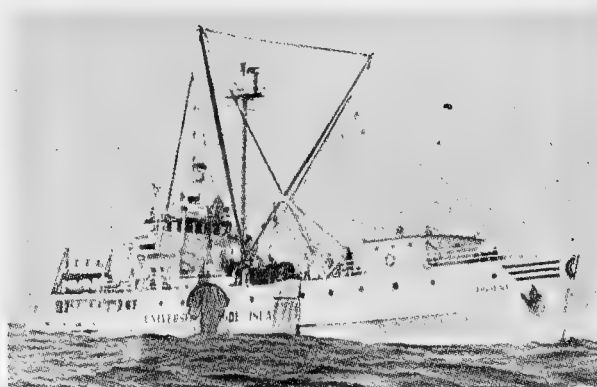
The National Science Foundation has provided funds for a new research vessel for the Duke University Marine Laboratory, Beaufort, N. C., according to reports. The vessel should be delivered in the summer of 1964. Its first cruise is tentatively scheduled for July 30, 1964. It will accommodate 15 to 26 scientists as well as up to 15 crewmen. Its over-all length will be 117½-feet, with an average displacement of 474 tons and a range of 4,500 to 5,000 nautical miles.

The new vessel should contribute to improved observational coverage and over-all knowledge of the continental shelf between Chesapeake Bay and the area off Georgia. (National Oceanographic Data Center, Newsletter, October 31, 1963.)

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RESEARCH VESSEL "TRIDENT" COMPLETES FIRST YEAR OF OPERATION:

During its first year of operation, the University of Rhode Island (URI) research vessel Trident logged more than 30,000 miles, com-



University of Rhode Island research vessel Trident.

pleted 11 scientific cruises, and spent 201 days at sea. The 180-foot, vessel carried 53 members of the URI Graduate School of Oceanography, as well as faculty members from other Universities, on expeditions ranging from Block Island Sound off Rhode Island to the West Coast of Africa.

"Operation DEBUT," the University's first cruise with the Trident, began September 15, 1962, in California, when a group of scientists and the crew took over the former Army maintenance and supply vessel, which was built in 1944 at a cost of \$1.2 million. (The U. S. Office of Naval Research spent an additional \$300,000 in converting the vessel.)

In the maiden cruise down the Coast of Central America through the Panama Canal and on to Providence, R. I., via Bermuda, scientists initiated open ocean bacteriological studies and began investigations of the form, structure, and organic functions of certain seaweed. In November 1962, the Trident was used for geological work in Block Island Sound. In mid-January 1963, a cruise was cut short because of mechanical problems.

On March 22, 1963, the vessel put to sea for its longest cruise. Ports of call included Bermuda; Monrovia, Liberia; and Sierra Leone. Operating off the west coast of Africa; bottom cores were taken, bottom sediments were sampled, the floor of the ocean was photographed, and numerous other projects were completed before returning to Narragansett Bay nearly three months later. One other cruise by the research vessel was conducted in June, plus 2 more in July, and 2 in August. In September, she cruised through the Sargasso Sea. At the beginning of October 1963, a scientific party equipped with an electronic

plankton sampling device began a voyage on the Trident of more than 2,000 miles to a point 300 miles southeast of Bermuda.

In the future, trips are planned to the Caribbean and the coast of Spain, as well as into the Gulf Stream, where it is hoped new techniques can be used to measure the flow of water. (National Oceanographic Data Center, Newsletter, October 31, 1963.)

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SEA BOTTOM OF THE CARIBBEAN AREA UNDER STUDY:

Geophysical events of the past 50 million years in the Caribbean Sea area were undergoing intensive study in late 1963 by scientists of the Woods Hole Oceanographic Institution aboard the 218-foot research vessel Chain.

From earlier land-based studies made on the island of Hispaniola, which includes Haiti and the Dominican Republic, it was determined that adjacent parts of the earth's crust in that area have behaved differently during this vast stretch of time. The crust under the eastern third of the Dominican Republic and eastward to Puerto Rico has remained relatively stable during this time. To the west, however, strong faulting and crustal warping was active and appears to be continuing today.

The chief scientist on the Chain cruise said that the objective of the present investigations is to determine the extent of these two areas of diverse crustal behavior by extending the previous landbased observations to a study of the crust under the sea.

The scientists used a variety of oceanographic instruments for the study. One key part of the investigation was the continuous measurement of the earth's gravity in the area, which varies to a minute but detectable degree depending on the thickness of the crust and its composition. To perform this job, a new shipboard data processing system was employed that automatically samples, computes, and records information on the ship's navigation, the depths of the ocean, and the gravity and magnetic fields of the earth.

The shape of the sea floor was studied by recording and measuring echo reflections from sounding equipment on shipboard. Bottom photography was employed as a means of obtaining a better idea of the sea floor composition by visual observation of undisturbed con-

ditions. Another technique to be used was a number of measurements of the flow of heat into the ocean from the earth, which is another indication of crustal activity.

The cruise, which was sponsored by the U. S. Navy's Office of Naval Research, was expected to last about six weeks. (Woods Hole Oceanographic Institution, December 2, 1963.)



Pollution

POTOMAC RIVER FISH LOSSES:

The Interstate Commission on the Potomac River Basin (ICPRB) reported that a technical conference by 13 agencies of Maryland and Virginia and the ICPRB had reached the tentative conclusion that the massive fish kill in the lower Potomac River and the Chesapeake Bay in mid-1963 was probably caused by a disease peculiar to white perch, the fish most affected by the kill. Vigorous study of possible bacterial and viral causes was recommended. (Sport Fishing Institute, Bulletin, November 1963.)

Note: See Commercial Fisheries Review, September 1963 p. 43.



Shellfish

LAKE ERIE SHELLFISH MAY HAVE COMMERCIAL VALUE:

Studies by biologists of the U. S. Bureau of Commercial Fisheries in Sandusky Bay, Lake Erie, have revealed the presence of substantial numbers of the Japanese snail and fresh-water mussels. The large live-bearing snails are highly prized by aquarists. Whether there is sufficient demand to warrant a small fishery is yet to be determined.

In addition to the Japanese snail, at least 12 species of fresh-water mussels were collected in Sandusky Bay. Efforts are under way to determine their abundance and suitability for use in making core pellets for the culture pearl industry. There is an excellent demand for fresh-water mussel shells for the Japanese pearl industry. As a result of the decline in Tennessee River fresh-water mussel shell production, buyers are seeking other sources of supply in the United States for the several thousand tons of shells needed each year.

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Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, NOVEMBER 1963:

| Item and Period | 1963 | 1962 | 1961 | 1960 | 1959 |
|--|-----------|---------|---------|---------|---------|
| (1,000 Lbs., Heads-Off) | | | | | |
| Total landings, So. Atl. and Gulf States: | | | | | |
| December | - | 8,615 | 6,538 | 7,099 | 8,716 |
| November | 13,200 | 11,604 | 9,996 | 14,454 | 12,412 |
| October | 21,872 | 14,699 | 12,696 | 21,688 | 19,601 |
| September | 18,195 | 13,182 | 9,691 | 18,832 | 18,330 |
| January-August | 75,188 | 57,739 | 52,474 | 78,961 | 71,600 |
| January-December | - | 105,839 | 91,396 | 141,035 | 130,660 |
| Quantity canned, Gulf States 1/: | | | | | |
| December | - | 1,879 | 816 | 894 | 1,173 |
| November | 2,400 | 2,727 | 2,175 | 1,535 | 2,122 |
| October | 4,180 | 4,454 | 2,065 | 2,480 | 2,324 |
| September | 3,640 | 1,727 | 598 | 2,222 | 1,936 |
| January-August | 16,961 | 12,423 | 8,846 | 19,263 | 15,104 |
| January-December | - | 23,210 | 14,500 | 26,394 | 22,659 |
| Frozen inventories (as of end of each mo.) 2/: | | | | | |
| December 31 | - | 31,577 | 19,755 | 40,913 | 37,866 |
| November 30 | 3/ | 27,500 | 20,668 | 37,264 | 37,334 |
| October 31 | 4/ 37,418 | 21,315 | 17,811 | 31,209 | 33,057 |
| September 30 | 4/ 27,356 | 12,843 | 13,361 | 24,492 | 26,119 |
| August 31 | 4/ 24,803 | 12,754 | 12,728 | 20,171 | 23,780 |
| July 31 | 4/ 25,460 | 13,677 | 14,849 | 17,397 | 22,352 |
| June 30 | 4/ 24,047 | 13,796 | 19,416 | 15,338 | 19,283 |
| Imports 5/: | | | | | |
| December | - | 15,798 | 15,442 | 12,411 | 10,611 |
| November | - | 17,964 | 14,852 | 13,516 | 10,269 |
| October | - | 18,279 | 16,813 | 14,211 | 15,340 |
| September | 10,236 | 9,696 | 8,629 | 8,190 | 7,541 |
| January-August | 90,085 | 79,446 | 70,546 | 65,091 | 62,794 |
| January-December | - | 141,183 | 126,268 | 113,418 | 106,555 |
| ... (¢/lb., 26-30 Count, Heads-Off) ... | | | | | |
| Ex-vessel price, all species, So. Atl. & Gulf Ports: | | | | | |
| December | - | 82.9 | 75.2 | 54.2 | 48.4 |
| November | 6/ 52-65 | 84.5 | 73.5 | 54.0 | 46.2 |
| October | 6/ 52-62 | 90.0 | 68.7 | 53.0 | 44.4 |
| September | 6/ 55-61 | 90.9 | 70.1 | 52.2 | 46.4 |
| August | 6/ 57-71 | 83.6 | 66.1 | 52.0 | 46.9 |
| July | 63.5 | 82.1 | 55.8 | 54.6 | 49.2 |
| June | 77.0 | 84.4 | 53.7 | 64.1 | 60.7 |
| May | 80.9 | 83.7 | 52.8 | 62.9 | 63.3 |
| Wholesale price frozen, brown (5-lb. pkg.) Chicago, Ill.: | | | | | |
| December | - | 101-107 | 91-92 | 68-70 | 64-66 |
| November | 71-78 | 105-110 | 89-92 | 69-73 | 60-65 |
| October | 67-75 | 108-115 | 83-90 | 69-73 | 59-62 |
| September | 73-77 | 113-118 | 87-90 | 65-70 | 62-64 |
| August | 75-81 | 110-112 | 76-91 | 64-67 | 62-64 |
| July | 80-97 | 3/ | 70-75 | 72-77 | 62-74 |
| June | 95-102 | 102-104 | 67-72 | 76-77 | 73-74 |
| May | 98-103 | 96-103 | 67-69 | 74-77 | 70-76 |

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. The figures in the section (Quantity canned, Gulf States) have been completely revised beginning with February 1963 on the basis of a new conversion factor (formerly 33.0 pounds per case).

2/Raw headless only; excludes breaded, peeled and deveined, etc.

3/Not available.

4/Inventory of June 30, 1963, includes 667,000 pounds; July 31, 1963, includes 925,000 pounds; August 31, 1963, includes 1,011,000 pounds; September 30, 1963, includes 2,868,000 pounds; and October 31, 1963, includes 1,203,000 pounds for firms not reporting previously.

5/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

6/Range in prices at Tampa, Fla.; Morgan City, La.; and Port Isabel and Brownsville, Texas, only.

Note: Data for 1963 are preliminary. November 1963 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.



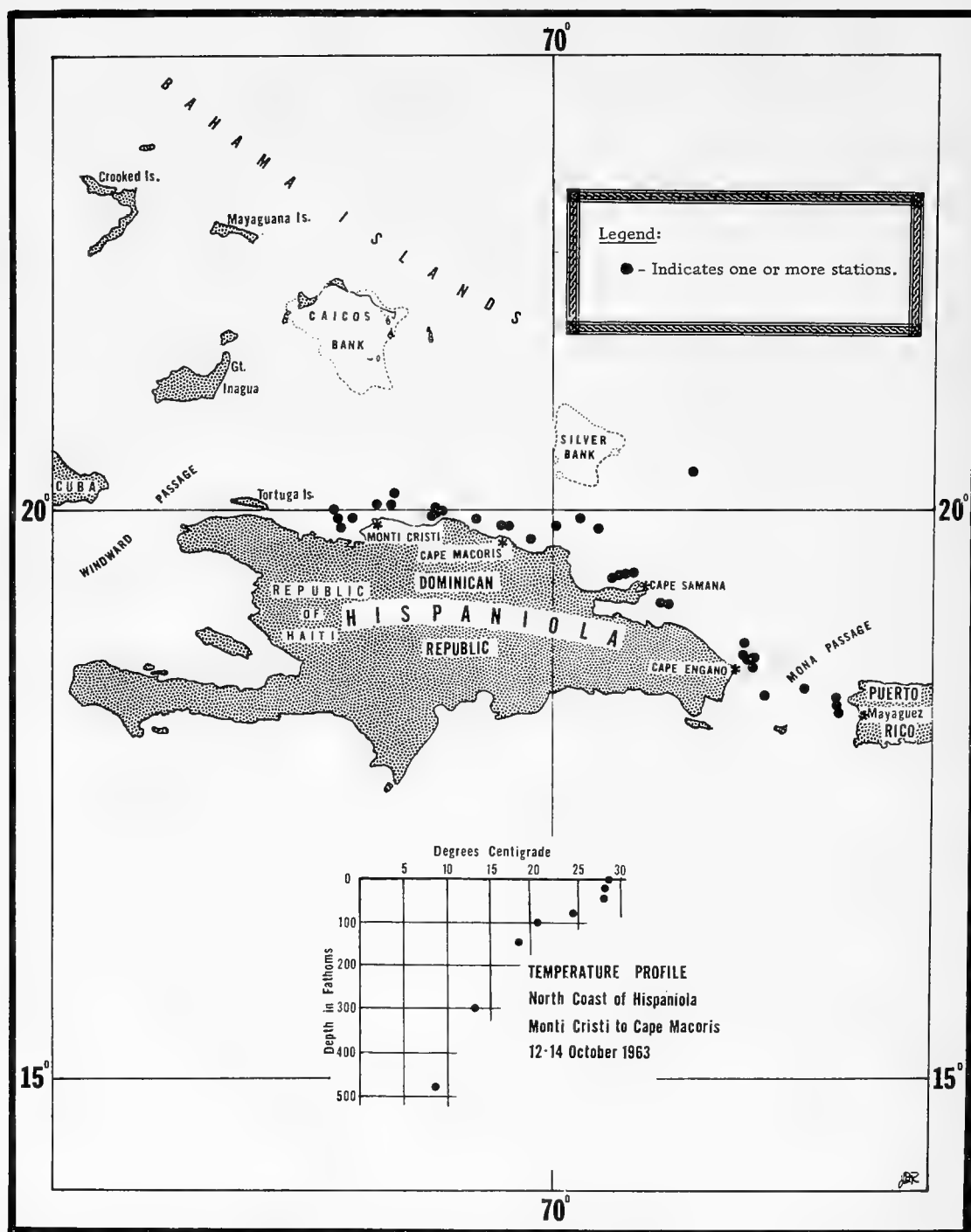
South Atlantic Exploratory Fishery Program

PRELIMINARY FISHERY EXPLORATIONS OFF HISPANIOLA AND SCALLOP SURVEY OFF FLORIDA:

M/V "Silver Bay" Cruise 50 (September 25-October 26, 1963): The principal objective of this 32-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay was to make a preliminary overall survey of the marine fauna of the waters in the lower Bahamas and off the north coast of Hispaniola. A wide variety of gear was used in an attempt to gain as complete as possible a picture of the resource potential of that area and its role in affecting the resources in adjacent areas--including the Puerto Rico-Lesser Antilles area and the Bahamas-Florida Straits area. Hurricane conditions, which were prevalent or threatening during much of the cruise, seriously interfered with the investigation.

Shrimp trawl drags were made over a total depth range of 25 to 800 fathoms off the north coast of the Dominican Republic, and in the Mona Passage off Puerto Rico. From 110 to 800 fathoms, the bottom was generally soft mud and subject to a moderate gradient. This provided conditions suitable for trawling, but weather conditions limited dragging explorations in that depth range to only 14 tows, which were too few for proper evaluation. Among the possible commercial species taken in small amounts were royal-red shrimp (Hymenopenaeus robustus) and scarlet prawns (Plesiopenaeus edwardsianus). The former were taken in 2 drags in 350 and 400 fathoms; the latter were taken in all drags between 170 and 800 fathoms. The average size of the scarlet prawns increased with depth until those near 800 fathoms counted 10 to 15 per pound (heads-on). Other shrimp species present in small numbers in a few drags beyond 100 fathoms included Aristaeomorpha foliacea, which have been taken in relatively large numbers elsewhere in the western Atlantic, and an unidentified penaeid resembling Penaeus schmitti, the South American shallow-water white shrimp.

Shallower depths were investigated with dredge and trawl gear, but were marked by very rugged bottom topography and heavy concentrations of coral, rock, and sponge, indicating a general unsuitability for commercial fishing with conventional trawls. Commercial



Areas investigated off Hispaniola (with temperature profile) during Cruise 50 of the M/V Silver Bay.

species of shrimp were present in small numbers in less than one-third of the drags made in 25 to 100 fathoms.

Two 60-hook tuna long-line sets were made off the north coast of the Dominican Republic along the 1,500-fathom isobath. The resulting

total catch consisted of four whitetip sharks. Sampling of surface and subsurface resources was also conducted with midwater trawls, plankton and larval trawls, and suspended wire fish traps. The catches were preserved for scientific study. Trolling lines set whenever the vessel was running between stations, took small numbers of dolphin, rainbow runners, and barracuda. Despite careful bridge watch, no surface fish schools were seen during the cruise.

Throughout the area surveyed off Hispaniola, bottom temperatures averaged lower than at equal depths in areas farther north and south. The fauna was distributed bathymetrically at correspondingly deeper levels, thereby adding additional evidence of the importance of temperature as an environmental factor in marine distribution.

The first part of the cruise included a brief re-survey of the scallop potential on the Florida east coast scallop bed. Thirty-two scallop stations were sampled between Bethel Shoals and Cape Canaveral in the 15 to 50 fathoms depth range. Catches of young scallops, 25 to 35 millimeters (0.98 to 1.18 inches) in width, ranged from 0.1 to 4.0 bushels per 30-minute drag (average 0.6 bushel) at 20 of the stations. This was indicative of the strong year-class of scallops which should reach commercial size during 1964. Catches of commercial size scallops ranged from 0.2 to 2.5 bushels per 30 minute drag (average 1.1 bushels) at 10 of the stations. Those scallops yielded approximately 85 meats per pound and the best catches were made in 27 fathoms off Cape Canaveral.



Tuna

AGE-GROWTH STUDIES OF BLUEFIN TUNA LANDED IN CALIFORNIA:

The California Department of Fish and Game's expanded bluefin tuna research program includes an assessment of the age composition of the California catch. Scales were chosen for preliminary age determination studies because they were easy to collect, process, and read, compared to such structures as otoliths and vertebrae.

Although untreated scales usually are difficult to read and require much individual handling, some difficulties were resolved by eosin staining, cleaning with potassium hydroxide, and using automatic tissue-process-

ing equipment. Crossing-over of circuli in the lateral fields and their crowding in the anterior field were diagnosed as annuli. Although scales from small fish exhibited crossing-over, this characteristic seldom was found in large fish because the lateral fields were obscured by scale thickening and circuli erosion. Scales from the caudal peduncle usually were clear and their annuli distinct compared to scales from beneath the second dorsal fin, although these were generally satisfactory.

The initial study included 247 bluefin tuna ranging from 51 to 142 centimeters (20.1 to 55.9 inches) fork length, collected from commercial landings at Terminal Island, Calif., during 1961 and 1962. An effort was made to sample 10 fish in each interval of 1 centimeter (0.394 inch), but several groups were not represented completely. About 50 percent of the samples could not be read because the scales were blistered, saturated with oil, or otherwise disfigured.

| Length of Bluefin Tuna in Age Groups I through V Years | | | | |
|--|-------------|-------|--------------|-----------|
| Age Group Years | Mean Length | | Length Range | |
| | Cms. | Ins. | Cms. | Ins. |
| 0 | 57.10 | 22.50 | 51-69 | 20.1-27.2 |
| I | 72.08 | 28.40 | 54-92 | 21.3-36.2 |
| II | 90.65 | 35.72 | 77-112 | 30.3-44.1 |
| III | 106.95 | 42.14 | 100-128 | 39.4-50.4 |
| IV | 128.50 | 50.63 | 124-135 | 48.9-53.2 |
| V | 142.00 | 55.95 | 142 | 55.9 |

Apparently bluefin grow rapidly, increasing in length about 15 to 21 centimeters (5.9-8.3 inches) per year. The mean length at each age compares reasonably well with length-frequency modes determined from market sampling. But additional corroborative evidence, such as growth records from tagging experiments, and serial collections of larval and juvenile fish, is needed. (California Department of Fish and Game, May 1963.)



United States Fisheries

COMMERCIAL FISHERY LANDINGS, JANUARY-SEPTEMBER 1963:

Total Landings: Fish and shellfish landings in the United States the first 10 months of 1963 were down 16 percent as compared with the same period of 1962. Landings were about 633 million pounds less than in 1962--due mainly to reduced catches of menhaden, ocean perch, Atlantic herring, and Alaska salmon.

Menhaden: Landings to October 31, 1963, totaled about 1.6 billion pounds--598 million pounds less than during the same period of 1962. The 10-month production was down in every State.

| United States Commercial Fishery Landings of Certain Species for Periods Shown, 1963 and 1962 | | | | |
|---|---------|-----------|-----------|------------|
| Species | Period | 1/1963 | 1962 | Total 1962 |
| (1,000 Lbs.) | | | | |
| Anchovies, Calif. 2/ | 9 mos. | 2,200 | 1,750 | 2,252 |
| Cod: | | | | |
| Maine | 8 mos. | 1,600 | 1,740 | 2,260 |
| Boston 3/ | 10 " | 16,900 | 19,554 | 21,213 |
| Gloucester 3/ | 10 " | 2,800 | 3,156 | 3,823 |
| Total cod | | 21,300 | 24,450 | 27,296 |
| Haddock: | | | | |
| Maine | 8 mos. | 1,600 | 1,453 | 2,545 |
| Boston 3/ | 10 " | 69,400 | 74,663 | 83,058 |
| Gloucester 3/ | 10 " | 14,100 | 13,565 | 16,089 |
| Total haddock | | 85,100 | 89,681 | 101,692 |
| Halibut: 4/ | | | | |
| Alaska | 9 mos. | 21,800 | 27,041 | 27,496 |
| Wash. & Oreg. | 9 " | 11,000 | 11,925 | 12,404 |
| Total halibut | | 32,800 | 38,966 | 39,900 |
| Herring, Maine | 9 mos. | 130,900 | 141,807 | 156,699 |
| Industrial Fish, Me. & Mass. 5/ | 10 mos. | 46,100 | 29,285 | 42,741 |
| Mackerel: | | | | |
| Jack 2/ | 9 mos. | 67,100 | 43,516 | 93,414 |
| Pacific 2/ | 9 " | 22,700 | 25,034 | 44,980 |
| Menhaden | 10 mos. | 1,557,300 | 2,155,458 | 2,249,900 |
| Ocean perch: | | | | |
| Maine | 8 mos. | 46,400 | 50,800 | 69,453 |
| Boston | 10 " | 900 | 655 | 909 |
| Gloucester | 10 " | 39,000 | 51,051 | 53,619 |
| Total ocean perch. | | 86,300 | 102,506 | 123,981 |
| Salmon, Alaska | 1963 | 214,300 | 280,000 | 280,000 |
| Sardine, Pacific | 10 mos. | 5,700 | 14,547 | 15,363 |
| Scallops, sea, New Bedford (meats) | 10 mos. | 14,200 | 16,919 | 19,309 |
| Shrimp (heads-on): | | | | |
| So. Atl. & Gulf | 10 mos. | 181,100 | 136,992 | 167,804 |
| Washington | 9 " | 900 | 1,380 | 1,400 |
| Squid, Calif. 2/ | 9 mos. | 7,300 | 7,056 | 7,056 |
| Tuna, Calif. | 10 mos. | 248,600 | 250,444 | 284,559 |
| Tuna, Atlantic | 1963 | 11,700 | 7,213 | 7,213 |
| Whiting: | | | | |
| Maine | 8 mos. | 15,900 | 17,468 | 17,832 |
| Boston | 10 " | 100 | 193 | 212 |
| Gloucester | 10 " | 46,400 | 51,018 | 53,183 |
| Total whiting | | 62,400 | 68,679 | 71,227 |
| Total all above items | | 2,798,000 | 3,435,683 | 3,736,786 |
| Other 6/ | | 640,300 | 635,451 | 1,502,914 |
| Grand total | | 3,438,300 | 4,071,134 | 5,239,700 |

1/ Preliminary.
 2/ Cannery receipts.
 3/ Landed weight.
 4/ Dressed weight.
 5/ Excludes menhaden.
 6/ Includes landings for species not listed.
 Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.

Salmon: On the basis of the reported pack of canned salmon, it is estimated that the 1963 catch in Alaska was approximately 214 million pounds--about 66 million pounds less than in 1962.

Shrimp: There was a significant gain in landings of South Atlantic and Gulf shrimp during the first 10 months of 1963 due to sharply increased landings in the Gulf States. Production in the South Atlantic and Gulf areas totaled

181 million pounds--an increase of 44 million pounds or 32 percent over the same period in 1962.

Tuna: Landings (including bonito) in California amounted to nearly 252 million pounds at the end of October 1963--about the same as in 1962. Atlantic Coast landings in 1963 amounted to 11.7 million pounds as compared with 7.2 million pounds in 1962. Although information on Oregon and Washington landings is not available, it is known that a good run of albacore occurred in the Pacific Northwest, and it is believed that the catch exceeded the 9.2 million pounds in 1962.

Ocean Perch: During the first 10 months of 1963, landings at Gloucester, Mass., totaled 39 million pounds--down about 12 million pounds from 1962--while Maine landings for the first 8 months of 1963 were 46 million pounds--a decrease of over 4 million pounds.

Mackerel: Pacific mackerel landings through September 1963, amounted to 23 million pounds--down 2 million pounds as compared with the same period in 1962. Landings of jack mackerel (67 million pounds) increased about 24 million pounds.

* * * * *

FISH STICKS AND PORTIONS, JULY-SEPTEMBER 1963:

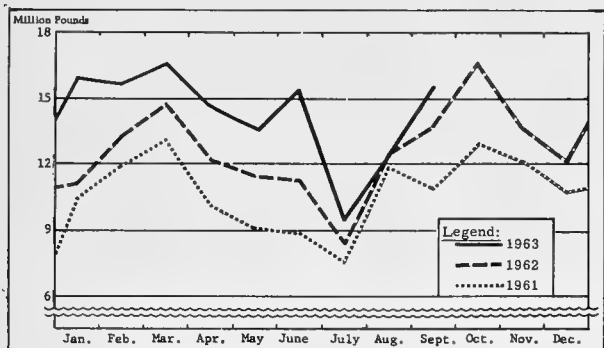
United States production of fish sticks and portions amounted to 37.2 million pounds during the third quarter of 1963, according to preliminary data. Compared with the same quarter of 1962, this was a gain of 2.6 million pounds or 7 percent. Fish sticks (16.4 million pounds) were up 274,000 pounds or 2 percent, and portions (20.8 million pounds) were up 2.3 million pounds or 12 percent.

Cooked fish sticks (15.2 million pounds) made up 93 percent of the July-September 1963 fish stick total. There were 20.1 million pounds of breaded fish portions, of which 16.2 million pounds were raw. Unbreaded portions amounted to 765,000 pounds.

| Month | Cooked | Raw | Total |
|--------------------------|--------|-------|--------|
| (1,000 Lbs.) | | | |
| July | 4,487 | 368 | 4,855 |
| August | 5,425 | 250 | 5,675 |
| September | 5,335 | 491 | 5,826 |
| Total 3rd Qtr. 1963 1/ | 15,247 | 1,109 | 16,356 |
| Total 3rd Qtr. 1962 | 14,725 | 1,357 | 16,082 |
| Total 1st 9 mos. 1963 1/ | 55,412 | 3,244 | 58,656 |
| Total 1st 9 mos. 1962 | 49,238 | 3,949 | 53,187 |
| Total Jan.-Dec. 1962 | 66,801 | 5,416 | 72,217 |

| Area | 1/1963 | | 2/1962 | |
|-----------------------|--------------|------------|--------------|------------|
| | No. of Firms | 1,000 Lbs. | No. of Firms | 1,000 Lbs. |
| Atlantic Coast States | 21 | 12,972 | 22 | 12,896 |
| Inland & Gulf States | 5 | 1,900 | 5 | 1,766 |
| Pacific Coast States | 10 | 1,484 | 9 | 1,420 |
| Total | 36 | 16,356 | 36 | 16,082 |

1/ Preliminary.
 2/ Revised.



U. S. production of fish sticks and portions, 1961-63.

| Month | 1/1963 | 2/1962 | 2/1961 | 1960 | 1959 |
|--------------------------|--------|--------|--------|--------|--------|
| (1,000 Lbs.) | | | | | |
| January | 7,634 | 6,082 | 6,091 | 5,511 | 6,277 |
| February | 8,246 | 6,886 | 7,097 | 6,542 | 6,352 |
| March | 7,846 | 7,658 | 7,233 | 7,844 | 5,604 |
| April | 6,687 | 5,719 | 5,599 | 4,871 | 4,717 |
| May | 6,165 | 5,643 | 5,129 | 3,707 | 4,407 |
| June | 6,538 | 5,117 | 4,928 | 4,369 | 4,583 |
| July | 4,855 | 3,740 | 3,575 | 3,691 | 3,790 |
| August | 5,675 | 5,760 | 6,927 | 5,013 | 3,879 |
| September | 5,826 | 6,582 | 5,206 | 5,424 | 5,353 |
| October | - | 6,698 | 6,133 | 6,560 | 5,842 |
| November | - | 6,305 | 6,288 | 6,281 | 4,831 |
| December | - | 6,027 | 5,618 | 5,329 | 4,743 |
| Total | - | 72,217 | 69,824 | 65,142 | 60,378 |

| Month | Breaded | | | Un-breaded | Total |
|--------------------------|---------|--------|--------|------------|--------|
| | Cooked | Raw | Total | | |
| (1,000 Lbs.) | | | | | |
| July | 823 | 3,552 | 4,375 | 225 | 4,600 |
| August | 1,149 | 5,241 | 6,390 | 254 | 6,644 |
| September | 1,839 | 7,453 | 9,292 | 286 | 9,578 |
| Tot. 3rd Qtr. 1963 1/ | 3,811 | 16,246 | 20,057 | 765 | 20,822 |
| Tot. 3rd Qtr. 1962 | 3,059 | 14,998 | 18,057 | 489 | 18,546 |
| Tot. 1st 9 mos. 1963 1/ | 11,943 | 54,917 | 66,860 | 2,214 | 69,074 |
| Tot. 1st 9 mos. 1962 | 9,875 | 43,953 | 53,828 | 1,554 | 55,382 |
| Tot. Jan.-Dec. 1962 | 14,007 | 62,290 | 76,297 | 2,381 | 78,678 |

The Atlantic Coast States remained the principal area in the production of both fish sticks and portions, with 13.0 and 11.0 million pounds, respectively. The Inland and Gulf States ranked second with 2.0 million pounds of fish sticks and 9.1 million pounds of fish portions. The remaining 2.1 million pounds of fish sticks and portions were produced by firms in the Pacific States.

Production of fish sticks and portions during the first 9 months of 1963 totaled 127.7 million pounds--19.2 million

| Area | 1/1963 | | 2/1962 | |
|-----------------------|--------------|------------|--------------|------------|
| | No. of Firms | 1,000 Lbs. | No. of Firms | 1,000 Lbs. |
| Atlantic Coast States | 23 | 10,997 | 24 | 9,550 |
| Inland & Gulf States | 6 | 9,117 | 12 | 8,328 |
| Pacific Coast States | 9 | 708 | 8 | 668 |
| Total | 38 | 20,822 | 44 | 18,546 |

| Month | 1/1963 | 2/1962 | 2/1961 | 1960 | 1959 |
|--------------------------|--------|--------|--------|--------|--------|
| (1,000 Lbs.) | | | | | |
| January | 8,199 | 5,077 | 4,303 | 3,632 | 2,692 |
| February | 7,383 | 6,360 | 4,902 | 3,502 | 3,025 |
| March | 8,687 | 7,036 | 5,831 | 4,706 | 3,225 |
| April | 8,004 | 6,408 | 4,484 | 3,492 | 2,634 |
| May | 7,411 | 5,818 | 3,879 | 3,253 | 2,684 |
| June | 8,819 | 6,137 | 4,039 | 3,995 | 3,247 |
| July | 4,600 | 4,679 | 3,962 | 4,088 | 2,227 |
| August | 6,644 | 6,687 | 4,963 | 3,558 | 2,796 |
| September | 9,578 | 7,180 | 5,745 | 4,631 | 3,558 |
| October | - | 9,871 | 6,759 | 5,275 | 4,314 |
| November | - | 7,406 | 5,789 | 4,790 | 3,483 |
| December | - | 6,019 | 5,191 | 4,459 | 3,262 |
| Total | - | 78,678 | 59,847 | 49,381 | 37,147 |

pounds above the same period of 1962. Fish sticks (58.6 million pounds) were up 5.5 million pounds (or 10 percent) and portions (69.1 million pounds) increased 13.7 million pounds (25 percent).



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, SEPTEMBER 1963:

| Area (Home Port) | Sept. 1963 | | Jan.-Sept. 1962 | | Total 1962 |
|---------------------------------------|------------|------|-----------------|------|------------|
| | 1963 | 1962 | 1963 | 1962 | |
| (Number) | | | | | |
| Issued first documents 2/: | | | | | |
| New England | 1 | 2 | 4 | 24 | 28 |
| Middle Atlantic | 1 | - | 4 | 2 | 3 |
| Chesapeake | 8 | 3 | 14 | 29 | 43 |
| South Atlantic | 8 | 6 | 15 | 37 | 47 |
| Gulf | 24 | 9 | 59 | 87 | 110 |
| Pacific | 3 | 5 | 10 | 115 | 130 |
| Great Lakes | - | 1 | 1 | 3 | 5 |
| Puerto Rico | - | - | - | - | 2 |
| Total | 45 | 26 | 107 | 297 | 368 |
| Removed from documentation 3/: | | | | | |
| New England | - | 5 | 38 | 19 | 24 |
| Middle Atlantic | 1 | 3 | 42 | 31 | 39 |
| Chesapeake | 3 | 2 | 16 | 19 | 23 |
| South Atlantic | 2 | 4 | 45 | 29 | 38 |
| Gulf | 9 | 15 | 87 | 86 | 104 |
| Pacific | 3 | 4 | 68 | 82 | 111 |
| Great Lakes | 2 | 3 | 13 | 18 | 22 |
| Hawaii | 2 | - | 3 | 3 | 3 |
| Puerto Rico | - | - | - | 1 | 1 |
| Total | 22 | 36 | 312 | 288 | 365 |

1/For explanation of footnotes, see table 2.

During September 1963, a total of 45 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 26 in September 1962. There were 22 documents cancelled for fishing vessels in September 1963 as compared with 36 in September 1962.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, September 1963

| Gross Tonnage | Issued 2/ | Cancelled 3/ |
|--------------------|----------------------|--------------|
| | (Number) | |
| 5-9 | 8 | 6 |
| 10-19 | 12 | 12 |
| 20-29 | 4 | 2 |
| 30-39 | 6 | - |
| 40-49 | 2 | - |
| 50-59 | 1 | - |
| 60-69 | 3 | 1 |
| 70-79 | 4 | - |
| 80-89 | 2 | - |
| 100-109 | - | 1 |
| 250-259 | 1 | - |
| 530-539 | 1 | - |
| 640-649 | 1 | - |
| Total | 45 | 22 |

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
 2/Includes 3 redocumented vessels in September 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 31 in 1963; 1 in 1960; 1 in 1958; 1 in 1954; 10 prior to 1951; and 1 unknown.
 3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
 Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U. S. Foreign Trade

AIRBORNE IMPORTS OF FISHERY PRODUCTS, AUGUST 1963:

Airborne fishery imports into the United States in August 1963 were up 28.4 percent in quantity and 22.1 percent in value from those in the previous month. Total airborne imports during January-August 1963 showed an increase of 21.1 percent in quantity and 29.6 percent in value from arrivals in the same period of 1962, due mainly to larger shipments of shrimp and spiny lobsters.

Raw headless shrimp continued to make up the bulk of the airborne shrimp imports--in August 1963, shipments consisted of 1,036,590 pounds of fresh or frozen raw headless and 43,708 pounds of frozen peeled and deveined shrimp. All of the airborne shrimp arrivals in August 1963 entered through the U. S. Customs District of Florida.

Airborne imports of shellfish other than shrimp this August consisted of 116,700 pounds of fresh or frozen spiny lobster products, which entered through the Customs District of Florida, 4,600 pounds of fresh or frozen crabmeat, most of which entered through the Customs District of Laredo (Tex.), and 6,700 pounds of unclassified shellfish.

Airborne imports of finfish in August consisted mainly of fresh or frozen fish fillets from Mexico, France, and British Honduras.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the

bulk of the airborne imports consists of fresh and frozen products.

U. S.^{1/} Airborne Imports of Fishery Products, January-August 1963 with Comparative Data

| Product and Origin ^{2/} | 1963 | | 1963 | | 1962 | |
|--|--------------------|---------------------|--------------------|---------------------|--------------------|---------------------|
| | August | | Jan.-Aug. | | Jan.-Aug. | |
| | Qty. ^{3/} | Value ^{4/} | Qty. ^{3/} | Value ^{4/} | Qty. ^{3/} | Value ^{4/} |
| | 1,000 Lbs. | US\$ 1,000 | 1,000 Lbs. | US\$ 1,000 | 1,000 Lbs. | US\$ 1,000 |
| Fish: | | | | | | |
| Mexico | 17.3 | 2.9 | 195.1 | 56.8 | 553.2 | 99.2 |
| British Honduras | 3.8 | 0.9 | 37.7 | 9.5 | 8.8 | 2.2 |
| Honduras | - | - | 16.5 | 4.3 | - | - |
| Japan | - | - | 2.0 | 8.2 | - | - |
| United Kingdom | 0.2 | 0.3 | 1.8 | 4.5 | - | - |
| Iran | - | - | 1.2 | 7.4 | - | - |
| France | 4.5 | 5.5 | 5.2 | 6.1 | 0.3 | 0.7 |
| Rumania | - | - | - | - | 1.3 | 11.3 |
| Panama | 0.9 | 0.4 | 0.9 | 0.4 | 7.8 | 1.3 |
| U.S.S.R. | - | - | 26.8 | 70.2 | - | - |
| Canada | - | - | - | - | 21.3 | 16.9 |
| Costa Rica | - | - | - | - | 5.6 | 0.9 |
| Other countries | - | - | 0.8 | 0.3 | 0.3 | 0.8 |
| Total Fish | 26.7 | 10.0 | 288.0 | 167.7 | 598.6 | 133.3 |
| Shrimp: | | | | | | |
| Guatemala | - | - | 141.6 | 74.0 | 199.6 | 99.7 |
| El Salvador | 12.5 | 7.2 | 221.6 | 150.6 | 410.1 | 261.6 |
| Honduras | 77.1 | 40.4 | 99.8 | 52.3 | - | - |
| Nicaragua | 45.8 | 13.0 | 426.0 | 135.5 | 977.2 | 328.6 |
| Costa Rica | 80.0 | 38.0 | 455.0 | 217.2 | 262.4 | 113.1 |
| Panama | 163.1 | 85.4 | 1,217.7 | 647.2 | 1,127.4 | 594.7 |
| Venezuela | 701.9 | 294.3 | 3,730.3 | 1,749.3 | 1,980.1 | 1,048.3 |
| Ecuador | - | - | 111.6 | 39.4 | 12.2 | 3.4 |
| France | - | - | 2.6 | 0.9 | - | - |
| Mexico | - | - | 13.2 | 6.9 | 24.8 | 9.1 |
| Netherlands Antilles | - | - | - | - | 3.1 | 2.7 |
| Total Shrimp | 1,080.4 | 478.3 | 6,419.4 | 3,073.3 | 4,996.9 | 2,461.2 |
| Shellfish other than Shrimp: | | | | | | |
| Mexico | 10.4 | 7.4 | 90.0 | 52.7 | 50.6 | 30.4 |
| British Honduras | 88.7 | 78.1 | 202.2 | 161.6 | 141.5 | 79.8 |
| El Salvador | - | - | 5.0 | 3.6 | 0.8 | 0.4 |
| Honduras | - | - | 1.9 | 1.0 | 113.0 | 80.7 |
| Nicaragua | 27.2 | 16.7 | 128.2 | 79.0 | 1.2 | 0.6 |
| Costa Rica | - | - | 73.8 | 60.1 | 1.4 | 1.2 |
| Jamaica | - | - | 51.0 | 40.1 | 30.0 | 21.3 |
| Netherlands Antilles | - | - | 32.8 | 20.9 | 15.9 | 10.0 |
| Colombia | - | - | 8.0 | 21.7 | 1.8 | 5.1 |
| Ecuador | - | - | 2.2 | 1.8 | 1.6 | 1.2 |
| Tunisia | - | - | 0.8 | 0.9 | - | - |
| Leeward and Windward Islands | - | - | 1.6 | 0.5 | 22.9 | 8.6 |
| British Guiana | - | - | 1.7 | 0.3 | - | - |
| Canada | - | - | 213.3 | 109.2 | 223.4 | 90.9 |
| Venezuela | - | - | 13.7 | 6.0 | 22.3 | 13.6 |
| Panama | 1.5 | 1.2 | 1.5 | 1.2 | 1.0 | 1.0 |
| Guatemala | - | - | - | - | 8.5 | 4.6 |
| Bahamas | - | - | - | - | 1.9 | 0.8 |
| Dominican Republic | 0.2 | 0.2 | 22.2 | 20.9 | 7.2 | 5.4 |
| Yugoslavia | - | - | 1.2 | 0.7 | - | - |
| Trinidad | - | - | - | - | 2.3 | 1.0 |
| Other countries | - | - | 2.0 | 2.9 | 0.6 | 1.5 |
| Total Shellfish (except shrimp) | 128.0 | 103.6 | 853.1 | 585.1 | 647.9 | 358.1 |
| Grand Total | 1,235.1 | 591.9 | 7,560.5 | 3,826.1 | 6,243.4 | 2,952.6 |

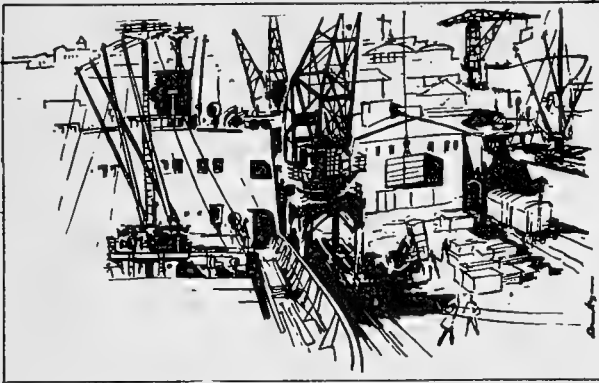
1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.
 2/When the country of origin is not known, the country of shipment is shown.
 3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.
 4/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.
 Note: These data are included in the over-all import figures for total imports, i.e., these imports are not to be added to other import data published.
 Source: United States Airborne General Imports of Merchandise, FT 380, August 1963, U. S. Bureau of Census.

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EXPORTS OF EDIBLE FISHERY PRODUCTS, SEPTEMBER 1963:

Exports of processed fish and shellfish from the United States in September 1963 were up 81.3 percent in quantity

and 133.3 percent in value from those in the previous month due mainly to much larger shipments of canned salmon to the United Kingdom.



Compared with the same month in 1962, the exports in September 1963 were up 16.0 percent in quantity and 90.9 percent in value. The gain in volume was limited by a sharp drop in exports of canned sardines not in oil which partly offset generally higher shipments of most other canned fish export items.

| Item | QUANTITY | | | | VALUE | | | |
|--|----------|------|------------|------|-------|------|------------|------|
| | Sept. | | Jan.-Sept. | | Sept. | | Jan.-Sept. | |
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| Fish & Shellfish, Processed only (excluding fresh & frozen) | 2.9 | 2.5 | 22.9 | 23.7 | 2.1 | 1.1 | 10.6 | 9.9 |
| 1/Includes pastes, sauces, clam chowder and juice, and other specialities. | | | | | | | | |

Processed fish and shellfish exports in the first 9 months of 1963 were down 3.3 percent in quantity but up 7.1 percent in value from those in the same period in 1962. The decline in quantity was due mainly to lower shipments of canned sardines and a drop in exports of canned mackerel to the Congo Republic. There were increases in exports of the higher-priced canned salmon and canned shrimp, as well as larger shipments of canned squid. Although not covered in the table, exports of frozen shrimp were up sharply in the first 9 months of 1963 (increase mostly in exports to Japan), and there was a substantial increase in exports of frozen salmon. Source: United States Foreign Trade (Trade by Commodity), Summary Report FT 930-E, September 1963, U. S. Department of Commerce. Note: The quantity of U. S. imports of fishery products is not currently available in summary form.

IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-November 2, 1963, amounted to 43,462,313 pounds (about 2,069,634 std. cases), according to data compiled by the Bureau of Customs. This was 8.3 percent less than the 47,404,873 pounds (about 2,257,375 std. cases) imported during January 1-November 3, 1962.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1963 at the 12½ percent rate

of duty is limited to 63,130,642 pounds (or about 3,006,221 std. cases of 48 7-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

IMPORTS OF FISH MEAL AND SCRAP BY CUSTOMS DISTRICTS, SEPTEMBER 1963:

| Customs Districts | September 1963 |
|--|----------------|
| | Short Tons |
| Maine and New Hampshire | 460 |
| New York (N. Y.) | 578 |
| Massachusetts | 185 |
| Maryland | 1,758 |
| North Carolina | 937 |
| Georgia | 3,145 |
| Mobile (Ala.) | 9,399 |
| Galveston (Tex.) | 8,829 |
| Los Angeles (Calif.) | 2,643 |
| San Francisco (Calif.) | 2,978 |
| Washington | 2,125 |
| Dakota | 190 |
| Duluth (Minn.) and Superior (Wis.) | 435 |
| Michigan | 375 |
| Florida | 518 |
| Other Customs Districts | 111 |
| Total | 34,666 |

Note: A list of the entry ports included within each Customs District is given in Schedule D, Code Classification of United States Customs Districts and Ports, which may be obtained free of charge by writing to the Foreign Trade Division, Bureau of the Census, U. S. Department of Commerce, Washington, D. C. 20233.

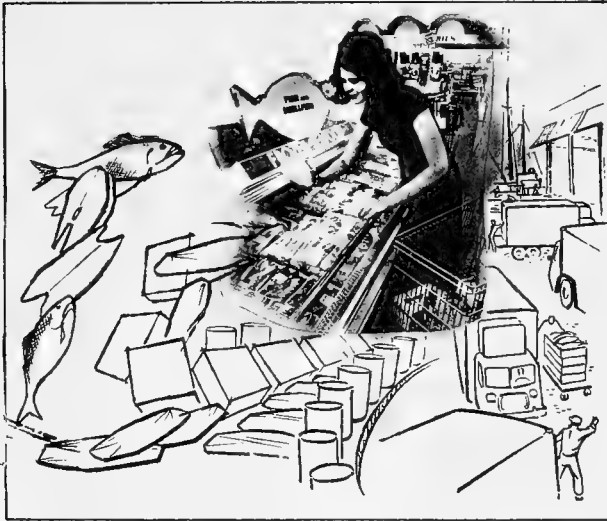


Wholesale Prices

EDIBLE FISH AND SHELLFISH, NOVEMBER 1963:

Wholesale prices for edible fish and shellfish (fresh, frozen, and canned) moved slightly downward in November 1963. At 106.1 percent of the 1957-59 average, the November index was lower than the previous month by 0.7 percent. While prices were up or down for specific items in most of the subgroups, the over-all index drop was largely due to more extensive marketing of lower-priced frozen halibut and salmon as a substitute for very light supplies of the fresh product, as seasonal fishing for those species neared an end. Compared with November 1962 (when prices with few exceptions were higher for all products), the index for November 1963 was down 10.3 percent.

From October to November, the drawn, dressed, or whole finfish subgroup index was down 3.8 percent and was lower than in No-



November 1962 by 3.1 percent. Prices at New York City for western dressed halibut and salmon in November were considerably lower than in October because of the seasonal mar-

ket transition from the fresh product to the frozen product. Those lower prices were partly offset by a substantial increase in prices for ex-vessel large haddock at Boston (up 19.9 percent) because of lighter landings, and an advance in prices for Lake Superior whitefish at Chicago. As compared with November 1962, prices in November were lower for all items in the subgroup except large haddock (up 43.0 percent). November prices for frozen halibut were lower by 25.1 percent from the same month a year earlier because stocks in cold storage were substantially greater.

November's higher prices for fresh haddock fillets at Boston (up 14.9 percent) and shucked standard oysters at Norfolk were responsible for an 0.6-percent increase from the previous month in the subgroup index for processed fresh fish and shellfish. But those higher prices in November were offset by lower prices for fresh shrimp (down 2 cents a pound at New York). During November fresh haddock fillets were higher-priced (up

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, November 1963 with Comparisons

| Group, Subgroup, and Item Specification | Point of Pricing | Unit | Avg. Prices 1/ (\$) | | Indexes (1957-59=100) | | | |
|---|------------------|------|---------------------|-----------|-----------------------|-----------|------------|-----------|
| | | | Nov. 1963 | Oct. 1963 | Nov. 1963 | Oct. 1963 | Sept. 1963 | Nov. 1962 |
| ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) | | | | | 106.1 | 106.8 | 107.1 | 113.3 |
| Fresh & Frozen Fishery Products: | | | | | 109.0 | 110.0 | 110.6 | 123.7 |
| Drawn, Dressed, or Whole Finfish: | | | | | 117.0 | 121.6 | 125.6 | 120.8 |
| Haddock, lge., offshore, drawn, fresh | Boston | lb. | .16 | .13 | 124.7 | 104.0 | 98.5 | 87.2 |
| Halibut, West., 20/80 lbs., drsd., fresh or froz. | New York | lb. | .33 | .44 | 97.1 | 129.9 | 128.6 | 129.6 |
| Salmon, king, lge. & med., drsd., fresh or froz. | New York | lb. | .89 | .95 | 124.0 | 132.7 | 138.0 | 134.5 |
| Whitefish, L. Superior, drawn, fresh | Chicago | lb. | .56 | .53 | 83.6 | 78.3 | 100.7 | 100.7 |
| Yellow pike, L. Michigan & Huron, rnd., fresh | New York | lb. | .46 | .51 | 75.3 | 83.5 | 99.9 | 88.5 |
| Processed, Fresh (Fish & Shellfish): | | | | | 107.2 | 106.6 | 104.3 | 124.0 |
| Fillets, haddock, sml., skins on, 20-lb. tins | Boston | lb. | .54 | .47 | 131.1 | 114.1 | 104.4 | 99.6 |
| Shrimp, lge. (26-30 count), headless, fresh | New York | lb. | .73 | .75 | 85.0 | 87.9 | 83.2 | 121.9 |
| Oysters, shucked, standards | Norfolk | gal. | 7.75 | 7.63 | 130.7 | 128.6 | 130.7 | 130.7 |
| Processed, Frozen (Fish & Shellfish): | | | | | 98.6 | 97.5 | 97.4 | 120.7 |
| Fillets: Flounder, skinless, 1-lb. pkg. | Boston | lb. | .39 | .40 | 98.9 | 100.1 | 100.1 | 103.9 |
| Haddock, sml., skins on, 1-lb. pkg. | Boston | lb. | .38 | .39 | 111.4 | 114.3 | 105.5 | 107.0 |
| Ocean perch, lge., skins on 1-lb. pkg. | Boston | lb. | .34 | .34 | 119.2 | 113.4 | 117.5 | 118.3 |
| Shrimp, lge. (26-30 count), brown, 5-lb. pkg. | Chicago | lb. | .76 | .73 | 89.5 | 86.0 | 90.1 | 128.7 |
| Canned Fishery Products: | | | | | 101.2 | 101.7 | 101.4 | 109.4 |
| Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. | Seattle | cs. | 23.25 | 23.50 | 101.3 | 102.4 | 104.6 | 111.1 |
| Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. | Los Angeles | cs. | 10.88 | 10.88 | 96.6 | 96.6 | 96.6 | 104.4 |
| Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs. | Los Angeles | cs. | 5.75 | 5.75 | 97.5 | 97.5 | 97.5 | 2101.6 |
| Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. | New York | cs. | 8.84 | 8.84 | 113.3 | 113.3 | 102.1 | 119.4 |

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

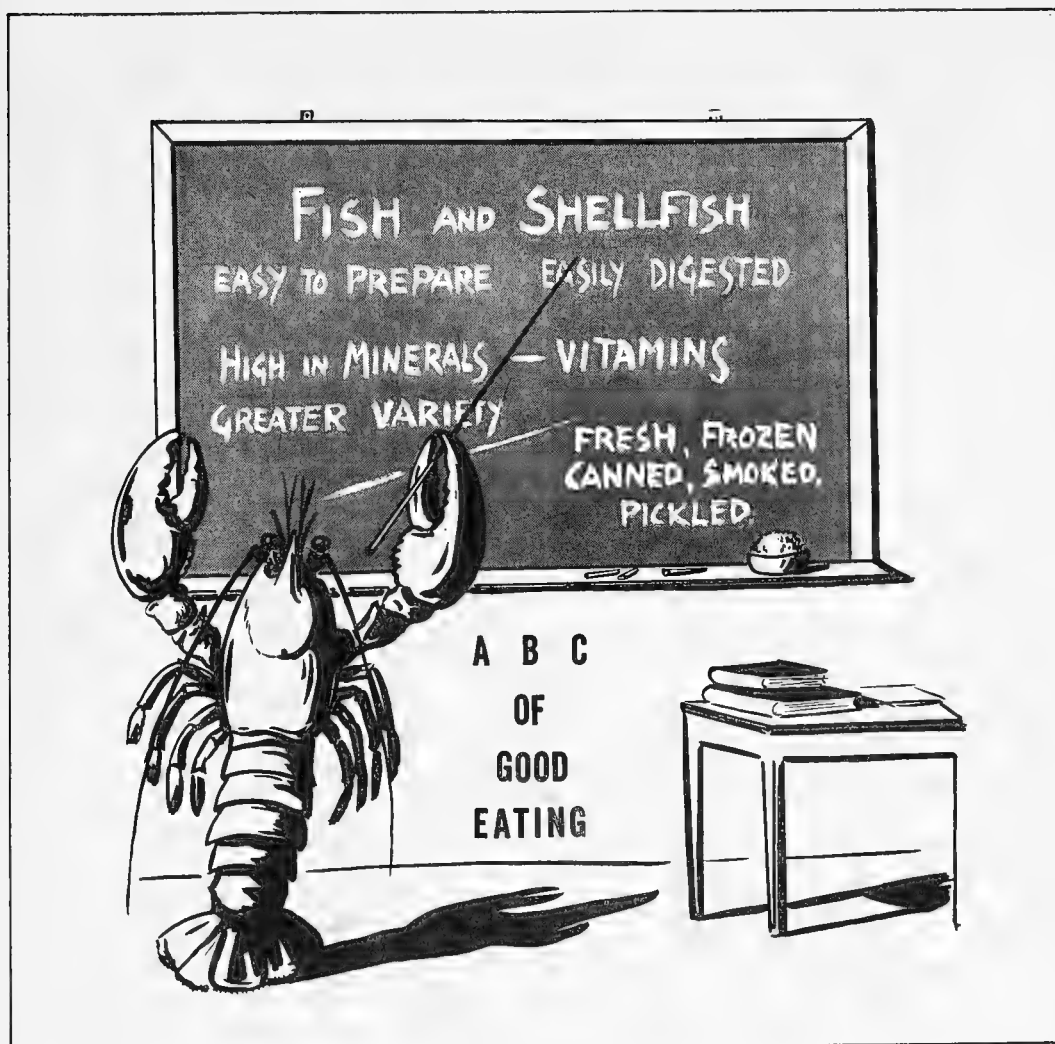
2/One commodity has been dropped in the fishery products index as of December 1962--"Sardines, Calif., tom. pack, No. 1 oval (15-oz.), 24 cans/cs."--and replaced by "Mackerel, jack, Calif., No. 1 tall (15-oz.), 48 cans/cs." Based on Calif. sardines and not directly comparable with replacement (jack mackerel) for January-November 1963.

31.6 percent) than a year earlier, but fresh shrimp prices were down sharply (30.3 percent)--the subgroup index dropped 13.5 percent from November 1962.

The subgroup index for processed frozen fish and shellfish rose 1.1 percent from October to November but was 18.3 percent lower as compared with the same month a year earlier. Lower prices for flounder and small haddock fillets in November were cancelled out by a price increase for frozen shrimp (up 4.1 percent). In the face of high November shrimp inventories and Gulf shrimp landings

that were still at a good level, the advance in frozen shrimp prices at Chicago may be attributed in part to trading in shrimp futures on the commodity exchange in that city.

Slightly lower November prices for canned pink salmon were wholly responsible for a 0.5-percent drop in the price index for canned fishery products from October to November. Prices for other items in the subgroup were unchanged from October. As compared with November 1962, prices for all canned fishery products were lower in November 1963 and the subgroup index was down 7.5 percent.





International

FISHERY AGREEMENTS

GREEK-TURKISH FISHERY COOPERATIVE PROPOSED:

In a move to end the disputes between Greek fishing vessels and Turkish coastal patrols, the Greek Government was reported to have proposed the establishment of a joint Greek-Turkish Fishery Cooperative. Each country would supply half of the Cooperative's fishing fleet, which would be free to operate in waters between Greece and Turkey. If the Greek catch should exceed the Turkish catch, as a result of an imbalance in the number or capacity of the vessels supplied, Turkey would have the right to supply the Cooperative with a compensatory volume of fish caught in other Turkish waters. The proposed joint fleet would number about 1,000 vessels and would produce an estimated 5,000 metric tons a year, which would be marketed in both countries. A joint fund would be set up to finance fish processing by the Cooperative.

Turkey rejected a previous Greek proposal that Greek fishermen be permitted to buy licenses from the Turks for fishing rights outside a two-mile limit in Turkish waters. (United States Embassy, Athens, October 11, 1963.)

FOOD AND AGRICULTURE ORGANIZATION

WORKING PARTY ON ATLANTIC OCEAN TUNA RESOURCES MEETS IN ROME:

A special Working Party on the Rational Utilization of Tuna Resources in the Atlantic Ocean was convened by the Food and Agriculture Organization (FAO) of the United Nations in Rome, Italy, October 25-30, 1963. The United States Delegation consisted of Dr. J. L. McHugh, Bureau of Commercial Fisheries, United States Department of the Interior, Chairman; Mr. Fred E. Taylor, Deputy Special Assistant for Fisheries and Wildlife to the Under Secretary of State; Dr.

W. M. Chapman, Director, Van Camp Foundation; and Mr. Charles R. Carry, California Cannery Association. Official delegations attended from Brazil, France, Japan, Nigeria, Portugal, and Spain. Observers were present from the Federal Republic of Germany and from Italy.

The Working Party selected the following officers: Dr. J. L. McHugh, United States; Chairman; Sr. Fernando Lozano Cabo of Spain, and Mr. A. Takashiba of Japan, Vice-Chairmen; Dr. W. M. Chapman, United States, Rapporteur. A Steering Committee was appointed to consist of the Chairman, the two Vice-Chairmen, Capt. Paulo de Castro Moreira da Silva of Brazil, and Mr. E. N. C. Eziuzo of Nigeria. The Secretariat was provided by the Fisheries Division of FAO.

As world demand for protein food from the sea has increased, the Atlantic tuna fisheries have grown rapidly. Tuna fisheries have been prosecuted in the Atlantic by countries such as Spain, Portugal, France, and Norway for many years. However, since 1956, the total catch has more than doubled (from less than 100,000 to about 200,000 short tons) as a result of increased fishing and demand for tuna by Japan, the United States, Brazil, Nigeria, Senegal, and other nations. Already there are some indications that certain tuna resources in the Atlantic may be overfished. These circumstances led the Council of FAO, by resolution at its 40th Session in June 1963, to establish the Working Party.

No comprehensive and coordinated scientific studies nor adequate statistics on catches and fishing effort are being conducted for the Atlantic tuna resources as a whole. The Working Party agreed that such studies are needed urgently and outlined the kinds of investigation that are necessary.

The Working Party was not entirely in agreement as to the kind of organization best suited to conduct the work. Some delegations

International (Contd.):



Dr. J. L. McHugh, Bureau of Commercial Fisheries, Fred Popper and Horacio Rosa, Fisheries Division of FAO. FAO Working Party on Rational Utilization of Tuna Resources in the Atlantic Ocean, Rome, Italy, October 25-30, 1963.

wished to confer the necessary authority on an existing international organization. Others, including the United States, believed that a new organization should be established under an international convention among interested nations. It was agreed, however, that no appropriate organization now exists which has the authority to cover the broad area of the ocean in which tuna fisheries operate. It was agreed also that, whatever kind of organization was given the necessary authority, the areas and resources to be considered should be the entire Atlantic Ocean and its tunas and certain related species of fish. The Working Party recommended also that the relationship of this organization to FAO should be governed by Article XV or other appropriate Articles of the FAO Constitution.

The Report of the Working Party, together with its background documents, will be circulated to interested member nations and appropriate international organizations for review and comment. When comments have been received and collated, they will be forwarded to the interested parties. At that time a second session of the Working Party might be considered necessary. It was the opinion of the Working Party, however, that a second

session probably will not be necessary. Therefore, it would be appropriate for one or more nations to call a conference of plenipotentiaries, to take whatever action is deemed appropriate and necessary.

INTERNATIONAL ASSOCIATION OF FISH MEAL MANUFACTURERS

PERUVIAN ANNUAL CONFERENCE STRESSES QUALITY:

The 4th Annual Conference of the International Association of Fish Meal Manufacturers was held in Lima, Peru, October 28-31, 1963. This private organization of associations representing the fish meal industry and individual manufacturing companies was organized in 1960 and has its headquarters in England.

Some 250 delegates and observers participated in the Conference, representing fish meal interests in some 17 countries (Argentina, Chile, Japan, and Mexico were represented only by observers), and there were observers from the Food and Agriculture Organization (FAO) and the Fish Meal Exporters Organization.

The United States delegation consisted of 16 representatives of 7 private companies and the Assistant Director of the College Park (Md.) Technological Laboratory, U.S. Bureau of Commercial Fisheries.

Peru is represented in the Association by the Sociedad Nacional de Pesqueria (National Fisheries Society), which acted as host to the 4th Annual Conference. There were 29 Peruvian delegates in the list of participants, plus 127 observers, as well as several advisers, members of a scientific committee, and a secretariat.

International (Contd.):

Daily sessions of the Conference were held, beginning with the Inaugural Session on October 28, with the President of the Republic and several Cabinet Ministers in attendance. The opening address was made by the President of the National Fisheries Society, followed by the President of the Association. The President of Peru spoke briefly, and declared the Conference opened. A "Formal Session constituting the Annual General Meeting of the Association" was followed by a Marketing Meeting on October 29, and a General Session was held on October 30. The public meetings were largely given over to expressions of views by delegates on agenda items, with no recommendations or conclusions being announced. There were, in addition, meetings of a Scientific Committee and of the Executive Council, the latter being open only to members. The definitive business of the Conference appears to have been handled at closed-door "work sessions" of the Executive Council, the results of which were not made public.

The work of the Conference was summarized by the Association's retiring President, at the closing session on October 31, as follows:

(1) The Conference considered the improvement and standardization of quality of fish meal in order to improve the industry.

(2) A study of economic aspects of the industry was undertaken--the need for expanded markets, stability of prices, pricing in line with competing products, and promotion of sales through advertising and education of potential users. The prosperity of the industry seems to be assured, but there must be cooperation among manufacturers and every effort must be made to eliminate speculators and speculation. Reference was made to a report on the industry commissioned by the Association which will form the basis of an economic survey of the industry, to be continued from year to year.

(3) Improvement of marketing fish meal throughout the world, with special emphasis on sales promotion, was discussed. The industry has developed more quickly than marketing methods, which should be improved. Producers in various countries seem prepared to exchange ideas and give impetus to a study of improved methods.

(4) Fish meal and fish flour for human consumption was perhaps the most significant subject of the Conference. It seemed to be the consensus of the Conference that fish meal as it is now made, if it were produced under hygienic conditions, could be used as a basis for human food. This would be a cheaper and more readily available product for the vast task of feeding the increasing populations of the world than more refined fish protein concentrate. Its use in this way would also result in a greatly expanded market for fish meal. The valuable cooperation of the Food and Agriculture Organization, especially in the study of fish protein, was acknowledged. Fish meal manufacturers should be encouraged to do their own research looking to improvement of conditions under which their product is made.

In closing, the Association's President expressed the view that the 4-year old Association has done much for the fish meal industry, but that its strength depends upon the support it receives from its members, including free discussion and exchange of information, attendance at conferences, and full representation on the organization's scientific and executive committees, whenever and wherever they meet. He announced that the Chilean delegation proposed, upon its return to Santiago, to make formal application for membership in the Association. The membership of Chile, a growing factor in the fish meal industry, will strengthen the voice of the Association in the world.

The Conference was closed by the Peruvian Minister of Agriculture, who pledged the support of the Peruvian fish meal industry in promoting sales, advertising uses of the product, achieving better quality, in conservation practices,

in stabilizing prices, and in the scientific studies that are important for the development of the use of fish meal for human consumption. (United States Embassy, Lima, November 5, 1963.)

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

TENTH ANNUAL MEETING HELD IN VANCOUVER:

The Minister of Fisheries of Canada was the principal speaker at the opening session of the Tenth Annual Meeting of the International North Pacific Fisheries Commission which opened in Vancouver, B.C., on November 18, 1963.

The meeting brought together representatives of Japan, the United States, and Canada. These nations are signatories to a 10-year old fishing treaty which continues to lay down the ground rules for certain activities of their fishermen in the North Pacific.

The Annual Meeting reviewed progress in research on the high seas, considered recommendations for halibut fishing regulations in the eastern Bering Sea and studied the problems of protecting halibut stocks in the Gulf of Alaska endangered by the rapidly expanding trawl fisheries in that region. The Annual Meeting also reviewed qualification of certain fish stocks for continued abstention. Under the terms of the existing agreement, Japan refrains from fishing salmon and halibut in the eastern North Pacific and herring off the coast of British Columbia.

Prior to the beginning of the Annual Meeting, scientists from each of the member nations met in Vancouver for two weeks to analyze the results of research on the high seas.

The Annual Meeting held at Vancouver had no connection with new treaty negotiations begun in Washington, D. C., in June 1963 and continued in Tokyo in September which are to be resumed in Ottawa in the spring of 1964. The present treaty will continue in force, as it has for the past ten years, until it is either terminated by one year's notice from any member or replaced, by mutual agreement, by a new treaty.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

FISHERIES COMMITTEE MEETS:

The eighth session of the Fisheries Committee of the Organization for Economic Co-

International (Contd.):

operation and Development (OECD) was held in Paris, France, on October 14-15, 1963. Significant agenda items for this meeting included (1) an examination of a preliminary report of a study of Government subsidies and other financial support to the fishing industries of member countries, and (2) the 1963-1964 detailed program of work.

A large portion of the discussion was taken up with the examination of detailed appraisals of the different subsidy reports submitted by member countries. After the examination, the Committee instructed the Fisheries Committee Secretariat to prepare a revision of the subsidy study taking into account the various amendments adopted at the meeting. The revised version will be circulated to the respective governments in advance of the next OECD Fisheries Committee meeting.

In its examination of the detailed program of work for 1963-64, the Committee considered the work in progress on a number of studies including General Services to the Fishery Industry, Price Systems, Influence of Recent Changes in Customs Tariffs on Fishery Products, Harmonization of Studies on Costs and Earnings in Fisheries, and Training of Fishermen.

The next OECD Fisheries Committee meeting is scheduled for January 1964.

NORTH PACIFIC FISHERIES COMMISSION

REDUCTION OF HALIBUT QUOTA FOR TRIANGLE AREA RECOMMENDED:

The International North Pacific Fisheries Commission, (Canada, Japan, and the United States) concluded its Tenth Annual Meeting in Vancouver, B.C., on November 23, 1963. The Commission made decisions and recommendations on a number of questions affecting North Pacific fishing operations by the three countries. These recommendations will not take effect until approved by the member Governments.

Approximately 100 administrators, scientists, technical and industrial advisors, and observers took part in the work sessions, which covered a period of three weeks.

The Commission did not recommend any change in the list of stocks of fish which Japan refrains from fishing under the terms of the Convention. Therefore, Japanese fishermen will continue to refrain from fishing salmon in waters east of 175°W. longitude, halibut in the eastern North Pacific Ocean except in the Bering Sea, and herring off the west coast of Canada, except in the waters west of the Queen Charlotte Islands.

The Commission reviewed the results of the first year of its responsibility for management of the halibut fishery in the quota area of the eastern Bering Sea. During the season in this area, which lasted from March 25 to October 15,

1963, fishermen of the three nations very nearly attained the quota recommended by the Commission. The total catch was 10,944,000 pounds, of which Canadian fishermen took 4,058,000 pounds, Japanese fishermen took 3,670,000 pounds, and the United States fishermen took 3,216,000 pounds.

All members of the Commission agreed that the available evidence indicated that the 1964 quota in the eastern Bering Sea halibut quota area should be sharply reduced from the 1963 level. The Commission will recommend to its member Governments that the 1964 quota be 6,393,340 pounds. Starting dates and other arrangements will remain substantially the same as in 1963, although improvements will be made in the operation of the quota system. The season will close when the quota is attained, or on October 15, 1964, whichever is earlier.

The research program on halibut in the eastern Bering Sea will be continued and expanded.

The Commission embarked several years ago on an ambitious program of preparation of a comprehensive scientific report on the distribution and origin of salmon in the high seas. The first two volumes of this report have now been published and the remaining seven volumes are in advanced stages of preparation.

The Commission established a program of research and collection of data to go into effect in the event that any Japanese fishing for herring off the west coast of the Queen Charlotte Islands is undertaken. There is no indication of the establishment of such a fishery at present.

Japanese spokesmen informed the Commission that there will be no radical increase in Japanese trawling in the Gulf of Alaska in 1964. In 1963 Japan operated a maximum of four trawlers in the area. While there is no restriction in the Convention on fishing by Japan for other species of groundfish in this area, Japanese fishermen are required to abstain from taking halibut. The method and scale of Japanese trawling operations in the Gulf, plus the requirement of returning to the sea any incidentally-caught halibut, are expected to minimize effects of this fishery on the halibut stocks. Research on the problems and exchange of scientists and data will be continued. (International North Pacific Fisheries Commission, news release, November 23, 1963.)

WHALING

FAO APPEALS FOR VOLUNTARY LIMITS ON ANTARCTIC CATCH:

The Director General of the Food and Agriculture Organization (FAO) has appealed to whaling countries to voluntarily limit their catches of fin whales to 5,000 whales during the 1963/64 season which opened on December 12, 1963. He stated in a letter to the International Whaling Commission (IWC), that its recent quota reduction from 15,000 blue whale units last season to 10,000 for 1963/64 would be "completely ineffective as a conservation measure" for fin whales.

The Director General's letter continued, "Any serious attempt to reach the new quota will further reduce the stock of fin whales and delay the time when, even by the application of stringent conservation measures, those stocks can be rebuilt to a level at which they can sustain economic yields. . . . I am making this appeal because of the need for preventing

International (Contd.):

further and perhaps irreparable damage to the whale stocks and in the hope of enabling your Commission to make effective regulations in line with scientific evidence for the rational exploitation of this important resource--the only sizable commercial resource of the Antarctic Ocean."

For many years, the IWC limit on the total Antarctic catch has been 15,000 blue-whale units. Under this system, 1 blue whale is the equivalent of 2 fin whales, 2½ humpbacks, or 6 sei whales. The Chief of the Biology Branch of FAO's Fisheries Division said that most of the whales commercially caught in the Antarctic are fin whales; to achieve this season's quota of 10,000 units would mean catching as many as 16,000 fin whales in the coming season. He also said that merely to maintain the present sustainable yield of fin whales would mean catching fewer than 5,000 of them annually for a few years. (Food and Agriculture Organization of the United Nations, Rome.)



Angola

FOREIGN TRADE IN FISHERY PRODUCTS, 1962:

Exports: Angola's exports of processed fishery products in 1962 were down sharply from those in the previous year--shipments of fish meal declined 35 percent in quantity and 18 percent in value, and exports of dried and salted fish dropped 29 percent in quantity and 31 percent in value. The decline was not offset by the gain in exports of lower-valued fresh and frozen fish.

Italy was the leading buyer of Angola's fish meal in 1962 with 15,054 metric tons, followed by West Germany with 8,411 tons, Portugal with 2,399 tons, Austria with 1,983 tons, Poland with 1,717 tons and, France with

1,036 tons. Shipments to other countries accounted for the remaining 1,992 tons.

Angola's most important markets for dried and salted fish in 1962 were the Congo Republic which absorbed 5,614 tons and Mozambique which bought 5,307 tons.

Imports: Angola's leading fishery import is dried cod and arrivals totaled 2,338 tons valued at Esc. 42.9 million (US\$1.5 million) in 1962, compared with 2,039 tons valued at Esc. 37.7 million (\$1.3 million) in the previous year. Norway was the leading supplier of dried cod in 1962 with 1,303 tons, followed by the United Kingdom with 995 tons. (United States Embassy, Leopoldville, October 31, 1963.)

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FISHERIES TRENDS, NOVEMBER 1963:

The Government of Ceylon has purchased 1,500 tons of dried fish from Angola, of which 30,000 bags were exported from Benguela and 20,000 bags from Mocamedes, valued at about US\$227,500. The transaction was the first entry into the Asian market from Angola.

Exports from Porto Alexandre during September 1963 amounted to 391.7 metric tons of fish meal to Italy, valued at 1,752 contos (US\$60,665); 66.1 tons to Southern Rhodesia, valued at 642 contos (\$22,230); 66.1 tons to Lisbon, valued at 1,152 contos (\$39,889); and 19.4 tons of dried fish to the Congo valued at 103 contos (\$3,566), plus 46.5 tons of semi-dried fish valued at 253 contos (\$8,760). Plans have now been approved to electrify the port at a cost of approximately \$700,000. (United States Consulate, Luanda, November 13, 1963.)

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FISHERY LANDINGS SHARPLY LOWER FOR FIRST HALF OF 1963:

During the first half of 1963, landings of fish in Angola amounted to only 84,558 metric tons--down sharply from the landings made

Angola's Principal Fishery Exports, 1961-1962

| Commodity | 1962 | | | 1961 | | |
|---------------------------|-------------------------|------------|-----------|-------------------------|------------|-----------|
| | Quantity Metric Tons | Value | | Quantity Metric Tons | Value | |
| | | Esc. 1,000 | US\$1,000 | | Esc. 1,000 | US\$1,000 |
| Fish meal | 32,592 | 110,510 | 3,827 | 50,339 | 134,799 | 4,668 |
| Fish oil | 2,655 | 5,858 | 203 | 3,001 | 8,897 | 308 |
| Dried and salted fish . . | 13,412 | 80,384 | 2,783 | 18,866 | 116,234 | 4,025 |
| Canned fish | 1,630 | 23,048 | 798 | 1,775 | 24,596 | 852 |
| Fresh & frozen fish . . . | 19,079 | 15,052 | 521 | 1,229 | 4,915 | 170 |

Angola (Contd.):

in the similar periods of 1961 and 1962. Total landings for the year 1962 amounted to 269,280 tons as compared with 241,465 tons in 1961. The shortage of fish along Angola's coast continued into the third quarter of 1963. Indications were, as of mid-November, that the 1963 fish landings would be about the lowest on record. (United States Consulate, Luanda, November 20, 1963.)



Australia

JAPANESE TAKE MEASURES TO STOP DAMAGE TO FISHING GEAR:

The Australian Minister for External Affairs announced on November 14, 1963, the successful outcome of representations to the Japanese Government over recent incidents involving damage by Japanese fishing boats to the fishing gear of Australian fishermen off the coast of New South Wales.

The matter had been taken up with the Japanese Government at the request of the Australian Department of Primary Industry after incidents in which lobster pots and other gear were damaged by drifting Japanese long-line fishing gear. The Australian minister announced he had been informed by the Japanese Embassy in Canberra that the Japanese

advised the Department of External Affairs that similar warnings and information had been sent to the major Japanese tuna and bonito fishing associations.

A newspaper article which appeared subsequent to the Foreign Minister's announcement stated that Japanese Embassy officials denied reports that Japan was willing to pay compensation for lobster pot losses totaling about £A2,000 (US\$4,480) caused by the drifting tuna long-lines. The newspaper account reported a Japanese Embassy spokesman as saying the payment of compensation had not been discussed with the Australian Government, and that more talks would be held. (United States Embassy, Canberra, November 21, 1963.)



Canada

BRITISH COLUMBIA CANNED SALMON PACK LOWER IN 1963:

The pack of canned salmon in British Columbia in 1963 of about 1.2 million cases was down 35.5 percent from the 1.8 million cases packed in 1962. It was also lower by about 13.0 percent from the 1958-1962 five year average pack of close to 1.4 million cases. The pack from year to year is usually dependent on the cycle years for pink and sockeye salmon. However, in 1963 a tie-up of the

British Columbia Canned Salmon Pack, 1958-1963

| Species | 1963 | 1962 | 1/1961 | 1/1960 | 1/1959 | 1/1958 |
|---|-----------|-----------|-----------|---------|-----------|-----------|
|(Standard Cases--48-1-Lb. Cans)..... | | | | | | |
| Sockeye (red) | 157,747 | 297,717 | 398,236 | 226,912 | 256,388 | 1,074,305 |
| Spring (king) | 9,940 | 7,174 | 7,927 | 5,935 | 15,703 | 10,550 |
| Steelhead | 770 | 815 | 979 | 530 | 871 | 1,205 |
| Bluebacks | 11,361 | 12,097 | 12,527 | 23,345 | 10,114 | 11,103 |
| Coho (silver) | 145,692 | 175,638 | 234,047 | 69,237 | 215,098 | 120,424 |
| Pink | 757,087 | 1,188,661 | 661,458 | 219,658 | 458,747 | 451,802 |
| Chum (keta) | 118,309 | 134,483 | 95,400 | 87,884 | 138,865 | 230,636 |
| Total | 1,200,906 | 1,816,585 | 1,410,574 | 633,501 | 1,095,786 | 1,900,025 |

1/Totals are based on final revised figures.
Source, Chief, Economics Branch, Pacific Area, Canadian Department of Fisheries.

Fisheries Agency has notified all Japanese fishing vessels known to be operating off the Australian east coast to exercise every caution in their operations. To prevent the recurrence of similar incidents, Japanese fishing boats have also been provided with information about the areas in which Australian fishing gear is set. The Japanese Embassy

salmon fishermen between July 15 and August 3 during a period of good fishing for both pink and sockeye salmon undoubtedly contributed to the lower canned salmon pack.

Note: See *Commercial Fisheries Review*, January 1963 p. 79; February 1962 p. 59; January 1961 p. 57.

Canada (Contd.):

FISHERIES DEVELOPMENT PROGRAM PROPOSED:

Provincial representatives from throughout Canada were scheduled to attend a conference in Ottawa on January 20, 1964, to discuss proposals for a National Fisheries Development Program. The Provincial Government of Newfoundland has pressed for such a program, having submitted proposals to the Federal Government in February 1963 for additional Federal investment in the fishing industry.

The proposals due to be discussed in Ottawa called for a Canadian National Fisheries Development Program costing over C\$200 million. This would include a Federal investment in Newfoundland of about \$52.5 million (\$10.5 million per year for 5 years) which would supplement an investment of \$25 million (\$5 million for 5 years) by the Provincial Government of Newfoundland.

Based upon the pattern of Federal agricultural programs, the proposed program for Newfoundland follows:

(1) Producer marketing organizations to provide price stability and to enter into international commodity agreements. A salt cod marketing board similar to the wheat board would be created (cost \$5 million).

(2) Credit facilities to increase productivity similar to the Farm Improvement Loan Act and Farm Credit Act (cost \$50 million).

(3) Marketing research and expansion with self-liquidating export credits for salt fish like those used to promote grain sales (cost \$3 million).

(4) Rural fishing community developments like those provided under the Agricultural Rehabilitation and Development Act (cost \$5 million).

(5) Establishment of federal standards, grading, and inspection to improve fish quality (cost \$4 million).

The report which outlines these proposals stresses that Canada is the only important fishing nation in the world that does not have a national fishery development program. (United States Embassy, Ottawa, October 31, 1963.)

* * * * *

LONG-LINING BOOSTS NOVA SCOTIA'S SWORDFISH LANDINGS IN 1963:

Nova Scotia swordfishermen had good catches during the 1963 season, but ex-vessel prices were sharply lower. Swordfish landings were up by 300 percent over 1962, but the value increased by only about 10 percent.

A spokesman for the Canadian Department of Fisheries says it was simply a matter of supply and demand. The average price paid for swordfish in 1962 was about 45 cents a pound, but in 1963 it dropped to about 17 cents.

The main factor in the bigger catch of swordfish is the shift to the long-line fishing method. The baited hook method came into common use in 1962 and the swordfish catch has soared. While traditional harpooning is still used, the greatest number of swordfish are caught by the newer method.

Record catches were reported from all parts of Nova Scotia. The vessel Margaret M. landed 250 swordfish at Sydney in one trip. What is considered a record by a swordfishing vessel in the 65-foot class was established by the Caress II, with 207 fish in one trip.

More than 3,000 swordfish were landed at North Sydney by offshore vessels in August 1963, and good catches also were reported at Glace Bay, Lockeport, and Barrington Passage.

Provincial fisheries officials, who have sponsored the new technique of long-lining for swordfish, are confident that the lower prices which the consumer will pay for swordfish will result in the building up of a much bigger market, thus creating a bigger demand to offset the lower prices offered the fishermen. (Canadian Fisherman, November 1963.)

* * * * *

NEW BRUNSWICK FISHERMEN TO ENTER EAST COAST PURSE-SEINE FISHERY FOR TUNA:

The Industrial Development Section of the Federal-Provincial Atlantic Fisheries Committee (formerly known as the Vessel and Gear Section) met November 13-14, 1963, in the city of Quebec.

The meeting reviewed the progress in various fields such as new types of fishing craft and fishing gear and methods and processing facilities ashore. One of the major develop-

Canada (Contd.):

ments is the purse seine fishery for tuna along the Atlantic coast.

Discussed at a previous meeting of the Section and by the Committee as a whole, this project has now come to fruition. New Brunswick has gone ahead with two vessels of special design with the object of establishing a C\$1.0 million-a-year commercial tuna fishery in Charlotte County on the Bay of Fundy.

Two 92-foot steel stern trawler-seiners have been provided for two groups of Campobello Island fishermen at a cost of \$300,000 each under a Federal cost-sharing program. Agencies participating include the New Brunswick Fishermen's Loan Board, the New Brunswick Government, the Federal Department of Fisheries, and the Federal Government.

With a crew of 20 men, the vessels, Green Waters and Blue Waters, were built at Bathurst, N.B. They are equipped with the latest in navigation and fish-detection devices.

The two vessels are expected to transport 200 tons of skipjack and bluefin tuna every two weeks to a converted sardine cannery at Eastport, Maine.

This is Canada's first venture into the tuna fishery on the Atlantic Coast. Some United States fishermen have been successful in this fishery, and as a result the Atlantic provinces of New Brunswick and Nova Scotia became interested. (Canadian Fisherman, November 1963.)

* * * * *

NEW FISH-PROCESSING PLANTS FOR MARITIME PROVINCES:

The subsidiary of a large east coast Canadian fisheries company is constructing a new fish-processing plant in Lunenburg, Nova Scotia, which is designed to handle about 80 million pounds of fish a year. The fishing fleet will also be expanded. The total cost is estimated at C\$8 million with completion expected in early 1964.

Another new \$3 million plant capable of processing 30 million pounds of fish a year is to be built at Canso, Nova Scotia. Completion is scheduled for early 1965.

The Premier of Prince Edward Island has announced that a \$5-6 million fish-processing plant would be built at Georgetown. The cost will be shared by the Provincial Government and an unnamed Canadian-Norwegian company. Construction is expected to start in the spring with completion of the first stage of the project scheduled for the fall of 1964. (United States Embassy, Ottawa, October 30, 1963.)

* * * * *

NEWFOUNDLAND FISHERMEN TO BENEFIT FROM NEW SHORE FACILITIES:

A C\$450,000 program to construct 23 additional community facilities in Newfoundland fishing ports to provide winter employment, and at the same time improve handling and processing facilities for inshore fishermen, was announced on November 27, 1963, by the Canadian Fisheries Minister and the Minister of Fisheries for Newfoundland.

The community facilities are for processing and handling salt or fresh fish, and are made available to all the fishermen using the ports in which they are built. The locations will be decided upon through consultation with the provincial government, which is jointly sponsoring the project. Employment will be spread over a wide area. The province will provide the sites, supervise construction, maintain the buildings and equipment, and administer the facilities when they are completed. The Federal government will pay for the actual construction, which will employ local labor and materials.

Sixteen of the facilities, at an estimated cost of \$25,000 each, will provide salt fish processing facilities; the other 7, which will cost in the neighborhood of \$5,000 each, will be for the handling of fresh fish.

At present there are 30 community facilities along the Newfoundland coast. (Information Service, Department of Fisheries, Ottawa, November 27, 1963.)

* * * * *

NEWFOUNDLAND SWORDFISH LONG-LINING EXPERIMENTS SUCCESSFUL:

New long-lining techniques for catching swordfish on Newfoundland's Grand Banks and other areas have been successful. The Newfoundland Department of Fisheries experimental and demonstration vessel Beinir landed

Canada (Contd.):

293 swordfish at a processing plant in Harbour Grace, Newfoundland, in the early fall of 1963. The big fish were filleted, frozen, and wrapped in cheesecloth for sale to the United States market.

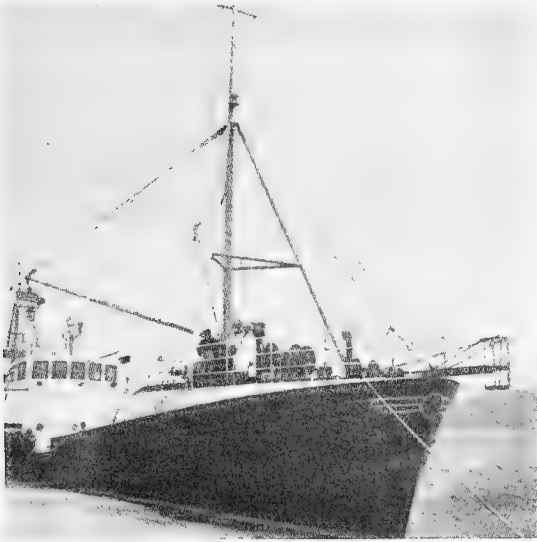


Fig. 1 - The fishing vessel, Beinir, used in experimental and demonstrational fishing for swordfish by the Newfoundland Department of Fisheries.

The Beinir's latest catch was taken from Banquereau and the western end of the Grand Banks in 7 fishing days. The weight of the landed catch, which had been dressed at sea, was 58,662 pounds, an average of slightly over 200 pounds per fish. The crew of 11 men received about C\$400 each for the 12-day trip.

In the course of her exploratory operations, the Beinir is collecting information on water temperatures and it has been established that swordfish are found only in water of 60° F. or higher. Also being charted is the course the fish take. The species apparently travels from the Cape Cod area in the spring to the fishing banks off Nova Scotia and Newfoundland and returns in the fall.

After discharging at Harbour Grace, the vessel left on another swordfishing venture, in the hope of gathering more data and another bumper catch.

The vessel's skipper says the 200-ton Norwegian built Beinir (117 feet long) is ideally suited for swordfishing, as she is big

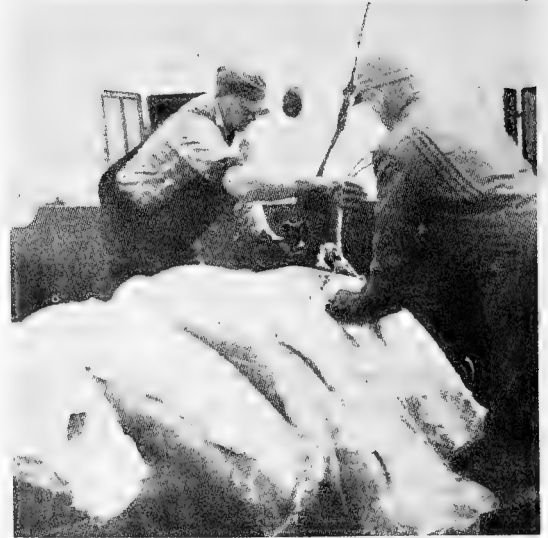


Fig. 2 - Some of the Beinir's catch of swordfish being unloaded at a Harbour Grace, Nfld., processing plant.

and sturdy enough to ride out storms. He thinks that a vessel of that type would best be used in the halibut fishery for the first two months of each year, and thereafter in the swordfishery as long as possible. (Trade News, a publication of Canada's Department of Fisheries, October 1963.)

* * * * *

PROCESS FOR DEHYDRATING FISH-POTATO MIXTURE DEVELOPED:

A process developed by the Canadian Food Research Institute of the Department of Agriculture for producing instant fish-potato flakes is now being given a full-scale commercial test.

The Industrial Development Service of the Department of Fisheries has purchased and installed the necessary equipment at the fish processing experimental plant located at Valleyfield on Newfoundland's northeast coast, and the first product has already come off the production line.

In the semicommercial pilot plant operation, steps are now being taken to test and improve the product.

The engineering staff of the Industrial Development Service has devised a series of tests to determine optimum operating conditions. These deal with such things as establishing the best proportion of fish to potato since the ratio of these two can be varied over a wide range as tests have already indicated. The optimum ratio is dictated by many factors such as the workability of the wet mixture with the equipment, taste, food value, and especially, economics.

The process involves the dehydration of a mixture of cooked fish and cooked potatoes on an external type drum dryer. The final product consists of snowy white, fine dry flakes, each flake containing fish and potato. However, both are so homogeneously blended that the individual ingredients are undetectable to the human eye. These flakes will reconstitute readily with the addition of water or other liquids

At Valleyfield, a study will also be made of the various kinds of fish suitable for the process. Most of the work

Canada (Contd.):

done to date has been on cod and it has been clearly demonstrated that this species is entirely satisfactory from a production standpoint.

Also, preliminary runs using salted cod have yielded a product which should find ready acceptance with the consumer.

The flakes have already been used in a variety of dishes. Their capacity to absorb moisture instantaneously makes them exceptionally well suited to making instant fishcakes. The simple addition of water or milk, and seasoning to taste, provides the reconstituted product. Only heating is required before eating. Deep fried fish croquettes, fish soup or chowder, and fish casseroles have been prepared in the Department's test kitchen.

Preparation of the product involves processing the two main ingredients separately. In the present method, the fish is filleted, cooked and ground. The potatoes are peeled, cooked, and diced. Both ingredients are mixed and additives are incorporated into the mash at this stage. The mash is spread mechanically on the outside of a steam-heated dryer.

The thin layer which adheres to the heated surface remains in contact on the hot drum for about 20 seconds and is scraped off the drum by a special blade in a continuous sheet. The sheet, approximately 10 thousandths of an inch thick, is broken into approximately 1/2-inch flakes.

This instant product is a very high protein food and it appears that it will have good keeping qualities. It is extremely light, an important consideration in shipping, and in an emergency could be eaten dry without reconstitution--hence, its importance as a ration or emergency food.

Contrasted with fish flour, which is white, odorless, and without fish flavor, this product maintains the identity of fish fiber and fish flavor.

Besides refining the process, the pilot plant operation will provide information on the cost of production. Also, samples are being produced for wide distribution to prospective manufacturers. (Canadian Fisherman, November 1963.)



Chile

FISHERIES TRENDS, NOVEMBER 1963:

The prolonged delay in the return of anchovies to Chilean northern coastal waters is of major concern to the expanding fish reduction industry. The dynamic growth of this industry in the north has made fisheries a real factor in the country's economy.

In three years, exports of fish meal have increased from US\$1.7 million in 1960 to \$7.9 million in 1962, and of fish oil from \$344,000 to \$1 million in the same years. In the first six months of 1963, exports of fish meal and fish oil totaled \$7.8 million. Anticipated earnings for the year, however, were being lowered in view of the loss of six weeks of fishing prior to November 9. All available fish meal was sold and a number of

firms were concerned over their ability to meet deliveries against December contracts.

The weather continued to be unseasonably cold in early November. It was said that the temperature of the coastal waters must rise 3⁰-5⁰ C. (5.4⁰-9.0⁰ F.) before the anchovies are likely to return in abundance.

The agreement establishing a Fisheries Development Institute was signed by the Government of Chile and the United Nations Development Fund on August 31, 1963. The plan of operation is designed to establish a permanent organization able to provide the technical basis for accelerated development and rational exploitation and use of Chile's fisheries resources. The United Nations Special Fund will contribute some \$1.3 million (about one-third) to the financing of the 5-year project. The Special Fund, through the Food and Agriculture Organization, also will provide the Project Manager (International Director) and other experts and consultants required to carry out the approved work program. (United States Embassy, Santiago, November 9, 1963.)



Colombia

BILL ESTABLISHING TERRITORIAL WATERS AT 200 MILES PASSES HOUSE:

A bill establishing Colombia's territorial waters at 200 miles was approved (September 12, 1963) by unanimous vote in the House of Representatives and in October 1963 was being considered in a Senate committee.

The only legislation concerning Colombia's territorial sea now on the books is Law 14 of 1923, which states that for the exploitation of undersea hydrocarbon deposits and fishing the territorial sea should be understood as 12 miles.

In the two recent Law of the Sea Conferences held under United Nations auspices, Colombia held two different positions. In the First United Nations Conference on the Law of the Sea at Geneva in 1958, the Colombian delegation supported a proposal establishing a 12-mile territorial sea. In the Second Law, of the Sea Conference in 1960, Colombia supported a joint United States-United Kingdom-Canadian proposal fixing the territorial sea at

Colombia (Contd.):

6 miles, plus 6 miles of contiguous waters for fishing rights, and recognizing "historic" fishing rights for a period of up to 10 years. Colombia had reserved the right to oppose the original tripartite proposal in which historic fishing rights of other countries were included on a more or less permanent basis.

In order to explain Colombia's reasons for its change in policy between the First Conference and the Second Conference, the then Foreign Minister issued a communique on March 2, 1960. The communique stated that Colombia had been pleased with the results of the First Conference since the conventions adopted constituted almost a complete code of international maritime law. It noted that this codification could be completed with the adoption of a territorial sea convention, and that this would be a practical and positive step in accordance with the United Nations Charter in the sense that it would organize mores according to law. The declaration stated that Colombia, therefore, would show its sincerity in adhering to these principles by voting for the United States-sponsored compromise proposal, which appeared to have the best chance of being approved. In addition, the document continued, the proposal guaranteed the exploitation of resources existing within 12 miles, ". . . which seems reasonable and sufficient for the expressed purposes." The communique also noted that the proposal did not "obstruct or weaken the traditional principle of freedom of the high seas." It said that "this would suffer detriment if large extensions of sea and overhead air space were to lose the character of free zones which they have always had." It added that exclusive control over large maritime zones would increase the obligations and responsibilities of the coastal state in direct proportion to the width of these zones. Mentioning the problems of security and individual and collective defense, the declaration indicated that the aforementioned proposal was one which would equitably and fairly reconcile the different points of view which had thus far been proposed.

On September 14, 1961, a conservative Colombian Senator presented Proyecto de Ley 138 which called for the establishment of Colombia's territorial sea at 12 miles at low tide. The bill was strongly supported by the Foreign Minister who reintroduced it in the Senate during the special sessions of 1962.

The bill was passed by the Senate by a large majority on April 13, 1962. In defending the Government's change of policy on this issue, the Foreign Minister said that the 3-mile limit recognized by the United States was "inconvenient to Colombia." However, the 12-mile limit, he went on, "was the universal current and convenient to Colombia." He noted that Panama and Venezuela both had 12-mile limits and that Colombia could not be placed in a position of inferiority vis-a-vis her neighbors.

No further action was taken on the 12-mile bill in the House of Representatives. Meanwhile, the opposition introduced a counter bill in the House which called for a 200-mile limit.

During the Spring of 1963 various proposals were put forth concerning the definition of Colombia's territorial sea. The Chairman of the House Foreign Affairs Committee added his sponsorship to the 200-mile bill; the Armed Forces proposed a 12-mile limit with 100 miles of contiguous sea; and fishing interests proposed a 12-mile limit with a contiguous sea varying from 100-160 miles. At the same time, the influential six-man Foreign Ministry Advisory Committee was convoked by the Ministry of Foreign Relations in the hope that it could agree upon a position.

The Chairman of the House Foreign Affairs Committee was successful in pushing through the 200-mile bill in his House committee in August 1963, and the same bill was carried unanimously by the full House on September 12. Hearings on that bill were being conducted by the Senate Foreign Affairs Committee. (United States Embassy, Bogota, October 22, 1963.)



Cook Islands

PLAN FOR JAPANESE-SUPPLIED TUNA CANNERY REJECTED:

After considerable debate, the Cook Islands Legislative Assembly in September 1963, voted 15 to 6 not to allow Japanese fishermen to land in Rarotonga to supply fish to a tuna cannery.

The question of a Japanese-supplied tuna cannery had been a lively topic in the Cook Islands for over two years, and had been offici-

Cook Islands (Contd.):

ally supported by the New Zealand Administration. (Pacific Islands Monthly, October 1963.)



Denmark

NEW TRADE AGREEMENT WITH SOVIETS MAY INCLUDE FISH FREEZERSHIPS:

A new Danish-Soviet trade agreement was signed in Moscow on November 22, 1963. It is valid for a period of six years from January 1, 1964 (expiration date of former agreement), and according to preliminary information, envisages an exchange of goods valued at between 225 and 230 million kroner (US\$32.6-33.3 million) annually. However, the Danish Foreign Minister, who signed the agreement for Denmark, emphasized that the new pact is only a skeleton agreement and that the minimum quotas established therein will be subject to annual renegotiation. The agreement includes an offer to Denmark to deliver 19 additional vessels (chiefly fish refrigerator vessels) worth 550-600 million kroner (US\$79.7-87.0 million) during the six-year period.

In reporting the conclusion of the new trade agreement, the Danish press declared that the annual value of trade in the amount of 225-230 million kroner in each direction represents an increase of 35-40 percent. However, under the agreement ending December 31, 1963, which envisaged trade in the neighborhood of 225 million kroner annually, actual imports from the Soviet Union aggregated only 162 million kroner (\$25.5 million) in calendar year 1962 and 124 million kroner (\$18.0 million) in the first 9 months of 1963.

The opportunity of delivering additional vessels is welcomed by Danish shipyards in view of the small amount of orders on hand, although it is realized that actual orders must be obtained in sharp competition with yards in other countries. (United States Embassy, Copenhagen, November 27, 1963.)



Ecuador

MANTA FISHING INDUSTRY EXPANDING:

The fishing industry is steadily gaining importance in Manta's economy. The recent discovery of a rich shrimp fishing area, 6 miles from Manta, was indicated by the presence of some 25 shrimp vessels in Manta's harbor where only tuna vessels were seen in the past. Other evidence of the uptrend in fishing operations includes the construction of about 7 new tuna vessels.

In the industrial fish field, a United States-controlled firm is planning to double its capacity for canning tuna during the coming year. Since the cannery is unable to can all the tuna available, a large part of the tuna catch is sold for freezing and export. The local price of 1,100 sucres per ton (about US\$60.00 at official rate of exchange) for fresh tuna is about one-fourth the fall 1963 price paid in the United States. Despite these operations, tuna fishermen of the Manta area are often unable to sell their catch.

Other interests in the Manta area are actively studying the possibility of establishing additional fish-meal operations in the area.

A new fish-freezing plant has been constructed by the Direccion de Pesca y Caza of the Development Ministry. The freezing plant processes various types of fish which are frozen and flown to Quito and other large inland cities. The manager of the freezing plant agrees that this is a relatively costly operation. One alternative is to purchase trucks capable of transporting frozen fish but the cost per truck of about US\$10,000 is beyond the resources of the freezing plant.

The manager of the freezing plant is engaged in experiments to examine the feasibility of processing fish through drying or salting so as to make essentially cheap fish available to consumers throughout Ecuador. The lack of fresh water apparently has not been a serious problem, as had been supposed, since a good source of salt water suitable for washing fish is available to the plant. (United States Consulate, Guayaquil, November 4, 1963.)

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SHRIMP PRODUCERS HURT BY LOWER PRICES IN UNITED STATES MARKET:

The expanding Ecuadoran shrimp export business has suffered a sharp setback due to lower wholesale prices in the United States

Ecuador (Contd.):

and a strengthened national currency. A good 1963 shrimp fishing season in the Gulf of Mexico oversupplied the United States market, increasing inventories 100 percent as of October 1963 over a comparable period of 1962. As a result, shrimp prices dropped sharply. The Ecuadorian sucre has strengthened since July 1963 from 21 per U. S. dollar to slightly under 19 early in November 1963. According to one producer, the net effect is that the sucre return as of November 1, 1963, was 25-36 percent lower than in July 1963.

Most likely to be injured by lower export shrimp prices is the small producer unable to sell to local processors. The crisis was expected to last at least 2 or 3 more months. (United States Embassy, Quito, November 1, 1963.)

**Egypt****PLANS FOR FOOD-PROCESSING PLANTS INCLUDE FISHERY PRODUCTS:**

The Cairo press reports that a plan had been drawn up by the Chairman of the General Egyptian Organization for Foodstuffs Industries to build 23 food-processing plants throughout Egypt, including three frozen shrimp-processing plants, and a tuna and sardine cannery. The aim is to increase exports of processed foods to other Arab and African countries. (United States Embassy, Cairo, November 16, 1963.)

**French Guiana****UNITED STATES SHRIMP FIRMS CONTINUE TO EXPAND:**

The two United States fishing companies established in French Guiana have increased their fleets and their catch. One of the firms located at St. Laurent plans a substantial enlargement of its shore facilities. Between them, the two companies now have about 55 vessels fishing for them with a total monthly catch of about 175,000 pounds. (United States Consulate, Martinique, November 2, 1963.)

**Ghana****CONTRACT WITH SOVIET UNION SIGNED FOR BUILDING FISH-PROCESSING PLANTS:**

A complex of fish-processing plants is to be built in Tema, Ghana, with Soviet assistance, under terms of a contract signed by the two countries on October 25, 1963. The new development is expected to have an annual capacity of about 12,500 metric tons of canned, frozen, and smoked fishery products. The Ghanaian Minister of Agriculture stated that the project would enable Ghana to reduce fishery imports and save £5 million (US\$14 million) per year in foreign exchange. (United States Embassy, Accra, November 2, 1963.)

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DOMESTIC AND FOREIGN DEEP-SEA TRAWLERS FISHING OUT OF GHANAIAN PORTS:

In response to a question in the Ghanaian National Assembly regarding the number and ownership of deep-sea fishing trawlers operating in Ghanaian waters, the Deputy Minister provided the following answer: "There are 4 Ghanaian-owned fishing ships and 17 foreign vessels operating in Ghanaian waters. The 4 Ghanaian-owned trawlers are based at Tema; 2 of these, Odaw and Kakum belong to the Ghana Fishing Corporation, the state organization. The other two are owned by private organizations--Ocefish by the Oce-fish Fisheries Limited, and Pioneer by the Mankoadze Fisheries Limited.

"The Ghana Fishing Corporation, Mankoadze Fisheries Limited, and Oce-Fisheries Limited also operate contracts held with certain foreign agencies for the supply of fish as follows:

"(a) The Ghana Fishing Corporation receives catches from 8 Russian vessels, 2 Japanese, and 2 Polish vessels.

"(b) The Mankoadze Fisheries Limited receives fish from 2 Russian vessels.

"(c) The Oce-Fisheries Limited receives fish from 3 Japanese vessels." (United States Embassy, Accra, November 17, 1963.)



Greece

NEW PURSE SEINE-TYPE NET HAULER DEVELOPED:

A Greek engineering company has developed a mechanically-driven net roller for purse seines, ring nets, and other surrounding nets.

The net hauler is made in two types. Type 710 for smaller vessels has a flange diameter of 3 feet 4 inches and when mounted on the deck has a height of about 8 feet. The groove of the roller is rubber-coated. Type 800-E is somewhat larger all around, and is intended for larger purse seiners, requiring a 6.3 hp. electric drive. The smaller roller turns at 18 r.p.m. and the larger at 21 r.p.m., the smaller being mechanically-driven from the main engine via a clutch.

The net hauler operates in the same way as a hanging roller or power block, but in this case, the net can be laid in the groove of the roller, and does not have to be threaded. On Type 800-E, this groove is rubber-lined and has serrations for extra gripping power.

The device has already been fitted to Greek fishing vessels and the manufacturers are offering an instructional service in its use. They claim that vessels using this type net hauler have been able to reduce their crews from 24 men to 11 men with greater safety and economy of time and effort. (World Fishing, November 1963.)



Guatemala

GUATEMALAN-JAPANESE SHRIMP FISHING VENTURE TRENDS, NOVEMBER 1963:

Reports from the joint Japanese-Guatemalan shrimp enterprise at Guatemala's Pacific Coast port of Champerico indicate that the joint company is operating thirteen 60-ton and seven 70-ton shrimp vessels. The vessels fish in an area about an hour's run from port. They are said to be averaging about 13 days per trip, usually bringing in about 2 tons of shrimp on each trip. The highest shrimp catch ever made on one single tow by a vessel is 330 pounds. Even when fishing is slow, the catch-per-tow is said to exceed 40 pounds. (Suisan Tsushin, November 20, 1963.)



Hong Kong

FOREIGN TRADE IN FISHERY PRODUCTS, 1961 AND 1962:

Hong Kong's foreign trade in fish and fishery products amounted to about US\$19.5 million during 1962. During this period, imports increased by 10.2 percent and exports (excluding reexports) by 90.1 percent over 1961. Communist China was the largest single provider of fish and fishery products imported into the Colony during that year, supplying 44.5 percent of total imports. Japan ranked second, supplying 17.0 percent, while Macao and the United States ranked third and fourth, providing 11.3 percent and 6.4 percent, respectively, of total imports.

Hong Kong exported US\$4 million worth of fish and fishery products during 1962. The United States was the best customer, buying 36.8 percent of the Colony's total exports. Japan ranked second, taking 21.2 percent, while Malaya and the United Kingdom were 3rd and 4th, at 8.9 percent and 8.3 percent.

Hong Kong's fish imports from the United States during 1962 increased 31.5 percent over the \$941,902 imported during the previous year while exports increased 146.4 percent over the \$597,370 exported during 1961. Reexports also showed a 6.6 percent increase over the \$24,609 figure for 1961. This increase in exports is probably due in part to the August 1961 rescission of the 1959 United States Foreign Assets Control regulation banning the importation of Hong Kong frozen shrimp into the United States. (This ban was imposed when it became known that Chinese Communist origin shrimp were being included in those exported to the United States; the Hong Kong Government subsequently undertook inspection and regulatory measures satisfactory to the United States.) The \$606,487 worth of frozen shrimp sold to the United States during 1962, the first full year following the lifting of the prohibition, illustrates the importance of this product to the Colony's fishing industry.

Other types of fish and marine products also showed an increase in sales to the United States during 1962. The following table lists a few which have registered sharp increases over 1961 figures.

| Hong Kong Exports of Selected Fishery Products to the United States, 1962 | | | |
|---|----------------|--------|----------|
| Product | 1962 | 1961 | Increase |
| | ... (US\$) ... | | Percent |
| Red snapper, frozen | 16,845 | 10,551 | 58.8 |
| Shark fins, salt-dried or smoked, | 71,380 | 27,312 | 159.9 |
| Shrimp, frozen, | 606,487 | 8,839 | 6,723.0 |
| Oysters, salt-dried or smoked, | 159,159 | 96,086 | 64.7 |
| Fish fry and aquarium fish. | 80,913 | 18,327 | 339.0 |
| Fresh water fish, canned . . | 142,187 | 56,912 | 148.4 |

The bulk of increased fish imports from the United States during 1962 was in the form of abalone. During that year, the Colony imported \$1,209,769 worth of abalone, a 69 percent increase over the amount imported in 1961. The biggest increase in the importation of this product was in the preserved but not canned category, which increased 146 times over the \$408 worth imported in 1961. While salt-dried or smoked abalone was not imported into Hong Kong from the United States in 1961, \$756.52 worth of this category was exported into the Colony in 1962. Imports of canned United States abalone during 1962 also increased by 37.7 percent over the \$829,251.83 imported in 1961. Most of the abalone imported into Hong Kong is Mexican-caught and canned and relabeled in California for reshipment to the Colony. Still not all of the imported abalone is consumed in Hong Kong as a good portion of it is reexported to overseas Chinese communities in Southeast Asia. At present South Africa is the biggest competitor in Hong Kong

Hong Kong (Contd.):

to United States canned abalone. (United States Consulate, Hong Kong, November 19, 1963.)



Iceland

FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-MAY 1963:

| Species | January-May | |
|--------------------|---------------------------|----------------|
| | 1963 | 1962 |
| | (Metric Tons) | |
| Cod | 176,938 | 176,572 |
| Haddock | 23,468 | 18,059 |
| Saithe | 5,273 | 6,951 |
| Ling | 3,676 | 5,081 |
| Wolffish (catfish) | 9,637 | 9,621 |
| Cusk | 4,517 | 3,907 |
| Ocean perch | 11,875 | 2,811 |
| Halibut | 406 | 569 |
| Herring | 96,050 | 84,129 |
| Shrimp | 349 | 349 |
| Capelin | 1,077 | - |
| Other | 1,753 | 1,906 |
| Total | 335,019 | 309,955 |

Note: Except for herring which are landed round, all fish are drawn weight.

* * * * *

UTILIZATION OF FISHERY LANDINGS, JANUARY-MAY 1963:

| How Utilized | January-May | |
|-------------------------------------|---------------------------|----------------|
| | 1963 | 1962 |
| | (Metric Tons) | |
| Herring^{1/} for: | | |
| Oil and meal | 65,570 | 57,924 |
| Freezing | 17,388 | 13,586 |
| Salting | 7,475 | 4,832 |
| Fresh on ice | 5,617 | 7,718 |
| Canning | - | 69 |
| Groundfish^{2/} for: | | |
| Fresh on ice | 16,929 | 15,229 |
| Freezing and filleting | 97,271 | 92,175 |
| Salting | 59,025 | 74,504 |
| Stockfish (dried unsalted) | 56,903 | 36,910 |
| Canning | 35 | - |
| Home consumption | 6,080 | 5,394 |
| Oil and meal | 1,227 | 1,143 |
| Capelin for: | | |
| Freezing | 188 | - |
| Oil and meal | 889 | - |
| Shrimp for: | | |
| Freezing | 267 | 263 |
| Canning | 82 | 86 |
| Lobsters for: | | |
| Fresh on ice | 2 | 122 |
| Freezing | 71 | - |
| Total production | 335,019 | 309,955 |

^{1/}Whole fish.
^{2/}Drawn fish.



India

FISHERIES EXPANSION
AIDED BY COOLEY LOAN:

A Cooley loan (funds derived from sale of surplus United States Agricultural commodities) of Rs.2,365,000 (US\$496,650) has been approved to a Ernakulam (State of Kerala) fisheries company, which has collaborated with a New York City fishery products marketing firm for expansion and improvement of shrimp, spiny lobster tails, processing facilities, and for seafood canning and freezing.

The expansion projects include plant and equipment for increased processing and freezing, canning facilities, trawler fleet, workshop and shipyard at Cochin, and trawlers, packaging, freezing, and storage plants at Bombay. Additional production from this project is estimated at 3.7 million pounds of different varieties of shrimp (including export of 1.6 million pounds of shrimp, 100,000 pounds of spiny lobster tails, and 160,000 pounds of frog legs), and about 2,000 tons of fresh fish annually. (United States Embassy, New Delhi, November 1, 1963.)

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FISHERY LANDINGS IN 1962,
AND FOREIGN TRADE, 1962/63:

Landings of fish and shellfish by India's fishing industry in calendar year 1962 totaled 973,859 metric tons compared with 960,969 metric tons in 1961. Although there was a decline in the 1962 marine fish landings, there was an increase in inland fish catches. The decrease in marine fish catches was due primarily to the shortage of oil sardines and mackerel on the west coast of India. Kerala was the most important fish-producing state in India in 1962, accounting for about 30 per cent of the total marine fish landings.

Government efforts to develop India's fishery resources, improve the socio-economic status of the fishermen, and promote exports continued during 1962. The program for the mechanization of fishing craft continued but at a lower rate than planned because of the shortage of foreign exchange.

Exports of Indian fish and fishery products in fiscal year 1962/63 (April 1-March 31) were valued at US\$8.57 million, an increase of about 4.5 percent over 1961/62. The United States was the largest single importer of Indi-

India (Contd.):

an fishery products and accounted for about 50 percent of the total value of India's fish exports. Frozen and canned shrimp exports in fiscal year 1962/63 were valued at \$6.74 million or about 75 percent of the total value of all fishery exports.

Imports of fish into India in fiscal year 1962/63 amounted to \$12.93 million, an increase of about 60 percent over the past year. Almost the entire quantity was imported from Pakistan. (United States Embassy, New Delhi, November 1, 1963.)



Iran

STATUS OF FISHING INDUSTRY, 1963:

A Government agency, the Iranian National Fisheries Company (Shilat), is the only commercial fishing company known to be operating in Iran. The Shilat concentrates on catching and processing the famous caviar-bearing sturgeon of the Caspian Sea. The Southern Fisheries Corporation, which was formed in early 1963 to aid economic development in the south of Iran and to supply the country with fish, was reported to have suspended operations at least temporarily in the latter part of 1963. At present, Iran does not maintain any important commercial fishery in the Persian Gulf. The annual catch by private Iranian fishermen operating in the Gulf is estimated at about 5,000 metric tons, part of which is sold to the cannery at Bandar Abbas. The Gulf landings are also used for animal food. A shrimp operation in the Gulf is being carried out by a Kuwait concern under a license obtained from the Shilat on September 24, 1962. The first year's catch of the Kuwait firm was estimated at 1,000 tons of shrimp, nearly all of which was exported to the United States. A Pakistan firm is also reported to be operating in the Gulf under an agreement with the Shilat.

The Shilat is intended to play a significant role in the Caspian fishing industry. The Company has the authority to regulate the size of the nets used by all Iranian fishermen and to enforce fishing seasons. All private fishermen must obtain operating licenses from the Shilat. The company is responsible for marketing all fish caught in the Caspian Sea.

In the fiscal year beginning August 1962, Iran produced about 210 tons of caviar and 1,700 tons of sturgeon meat. During that period, the Caspian Sea fishery also yielded about 700 tons of other fish species, most of which were marketed in Tehran. Fish is little known to the vast majority of the Iranian population. With the exception of the cannery at Bandar Abbas, the Shilat's facilities are concentrated in the northern section of Iran and consist of fishing stations along the Caspian Sea and a cold-storage warehouse and plant for smoking and salting fish at Bandar Pahlavi. The company has been reported to own 15 mechanized vessels and four 5-ton refrigerated trucks.

The annual capacity of the cannery at Bandar Abbas has been estimated at 5 million 5-ounce cans of tuna, sardines, or herring, but it is said to be producing only about 400,000 cans a year. The cannery has been described as modern in every respect, and an Iranian newspaper reported on August 8, 1963, that the cannery had contracted to supply a foreign company with one million cans of sardines.

The potential of the Iranian fishing industry, particularly in the south, seems considerable. Fish could become important not only as a consumer item in Iran, but as an export product. The Irano-Soviet Agreement for Economic and Technical Cooperation, signed in mid-1963, may stimulate the Iranian fishing industry. The Agreement is reported to contain the following fisheries projects: (1) construction of a sturgeon hatchery with an annual capacity of 3.5 million young fish; (2) a Soviet study of fish resources in the Caspian Sea; and (3) the stocking of the Caspian with 10,000 fish of the white Amur species from the Amur River in East Asia. The sturgeon-breeding plant is intended to replace the loss of natural spawning grounds with the construction of the Sefid Rud Dam in northern Iran. The white Amur fish are expected to eat the weed growing in the Bandar Pahlavi marshes which consumes the water's oxygen. The Amur fish are also expected to increase the supply of edible fish in the Caspian Sea. In addition, the Soviet Union is reported to have agreed to train an unspecified number of Iranians in fishery technology at Soviet schools and processing plants. (United States Embassy, Tehran, November 5, 1963.)

Note: See Commercial Fisheries Review, Oct. 1963 p. 52, July 1963 p. 79, June 1963 p. 73, September 1962 p. 80.



Jamaica

MARKET FOR CANNED SARDINES:

In Jamaica, canned sardines are very popular consumer items stocked by almost every grocery and supermarket on the Island. Canned sardines entering Jamaica are dutiable at 5 percent ad valorem from preferential (British Commonwealth) sources and 15 percent from other sources, but they are not subject to exchange restrictions or other limitations. In 1962, Jamaica imported 6,417,304 pounds of canned sardines with a c.i.f. value of £623,415 (US\$1,745,562). Canada was the leading supplier of canned sardines in oil, followed by Venezuela and the United States. Canada was also the leading supplier of canned sardines not in oil, followed by the United Kingdom and the Netherlands.

Import prices and wholesale prices in Jamaica for popular packs of imported sardines are given below:

| Case Size and Type | Wholesale Price | | C.I.F. Price | |
|---|-----------------|---------|--------------|--|
| | US\$/Case | C\$/Cs. | US\$/Cs. | |
| 100/3-1/4-oz. (flats), without key, packed in vegetable oil | 7.56 | 7.25 | 6.71 | |
| 48/7-oz. (oval cans), without key, packed in tomato sauce | 6.72 | 6.10 | 5.65 | |
| 24/13-oz. (oval cans), without key, packed in tomato sauce | 4.76 | 4.35 | 4.03 | |

Commercial circles have stated that, as regards canned sardines in oil, consumers show a preference for Canadian 3-1/4-oz. cans packed in vegetable oil, which has a low retail price of 9 cents per can. The same 3-1/4-oz. cans of sardines packed in other types of oil retail for almost 45 percent more than those packed in vegetable oil. (United States Embassy, Kingston, November 7, 1963.)



Japan

EXPORTS OF CANNED TUNA IN OIL, APRIL-SEPTEMBER 1962 AND 1963:

Data compiled by the Japan Canned Tuna Producers Association indicate that canned tuna in oil approved for export by that Association for the period April-September 1963 totaled 1,041,904 actual cases, as compared

Table 1 - Japanese Canned Tuna in Oil Exports by Country of Destination, April-September 1962 and 1963

| Country of Destination | April-September | |
|-------------------------|-----------------------------------|---------|
| | 1963 | 1962 |
| |(Actual Cases) | |
| West Germany | 321,150 | 162,856 |
| Canada | 157,643 | 135,554 |
| Great Britain | 100,571 | 28,850 |
| Switzerland | 61,680 | 38,305 |
| Belgium | 59,133 | 42,092 |
| Netherlands | 57,205 | 40,113 |
| Lebanon | 50,237 | 15,664 |
| Aden | 43,043 | 11,764 |
| Saudi Arabia | 31,959 | 13,074 |
| Okinawa | 27,923 | 7,287 |
| Other | 131,360 | 59,372 |

Table 2 - Japanese Canned Tuna in Oil Exports by Species, April-September 1962 and 1963

| Species | April-September | |
|---------------------|-----------------------------------|---------|
| | 1963 | 1962 |
| |(Actual Cases) | |
| Big-eyed | 368,671 | 138,627 |
| Skipjack | 306,826 | 170,451 |
| Albacore | 197,760 | 154,378 |
| Yellowfin | 47,536 | 9,826 |
| Flake, etc. | 121,111 | 81,649 |
| Total | 1,041,904 | 554,931 |

to 554,931 cases for the same 6-month period in 1962. (Suisan Keizai Shimbun, November 19, 1963.)

EXPORT QUOTA FOR CANNED TUNA IN BRINE TO UNITED STATES:

The Japan Canned Foods Exporters Association, at a meeting held on November 4, 1963, announced the establishment of an export quota of 2.5 million cases of canned tuna in brine for export to the United States for the business year beginning December 1, 1963, and ending November 30, 1964. This represents an increase of 200,000 cases over the export quota for the previous business year. As in the past, the new quota will be allocated to Japanese exporters on the basis of their past performance records. (Suisancho Nippo, November 15, 1963.)

FROZEN TUNA EXPORT PRICES STRENGTHEN:

Data compiled by the Japan Frozen Tuna Sales Company indicate that f.o.b. export prices for frozen tuna and tuna loins contracted for shipment to the United States from Japan proper have recovered remarkably since July 1963, when prices were at their lowest level. In October, albacore (frozen, round) prices averaged US\$347 per short ton, compared to \$285 in July, while yellowfin (gilled & gutted, 20-100 lbs.) averaged \$309 per short ton, as compared to an average of \$250 in July. (Suisan Tsushin, November 6 & 7, 1963.)

Table 1 - Average Export Prices for Frozen Tuna Shipped to United States Direct from Japan, April-October 1963, with Comparisons

| Month | Albacore 1/ | | Yellowfin 2/ | |
|---------------------|-----------------------------|------|--------------|------|
| | 1963 | 1962 | 1963 | 1962 |
| | (US\$ F.O.B. Per Short Ton) | | | |
| April | 399 | 365 | 337 | 348 |
| May | 380 | 379 | 325 | 346 |
| June | 3/ | 384 | 252 | 359 |
| July | 285 | 379 | 250 | 347 |
| August | 305 | 372 | 262 | 340 |
| September | 306 | 374 | 279 | 327 |
| October | 347 | 358 | 309 | 308 |

1/Round.
2/Gilled & gutted, 20-100 lbs.
3/No albacore contracted for export.

Japan (Contd.):

| Table 2 - Average Prices for Tuna Loins Shipped to United States Direct from Japan, April -October 1963, with Comparisons | | | | |
|---|----------|------|-----------|------|
| Month | Albacore | | Yellowfin | |
| | 1963 | 1962 | 1963 | 1962 |
| (US\$ F.O.B. Per Short Ton) | | | | |
| April | 837 | 815 | 726 | 730 |
| May | 781 | 819 | 731 | 741 |
| June | 763 | - | 678 | 746 |
| July | 683 | 833 | 612 | 738 |
| August | 725 | 800 | 629 | 730 |
| September | 792 | - | 673 | 707 |
| October | 775 | 730 | 677 | 661 |

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FROZEN TUNA EXPORT MARKET TRENDS, NOVEMBER 1963:

Japanese press reports in early November 1963 indicated that albacore exports to the United States continued to be very slow, and that very few sales had been concluded with United States packers. The United States poor demand for Japanese albacore was attributed primarily to the very good albacore catches by United States fishermen.

The price of Japanese frozen albacore for export to the United States in early November was reported to be about US\$390-400 per short ton (c. & f.). Albacore ex-vessel prices in Japan were quoted at a high of around 140 yen per kilogram (\$353 per short ton). Since Japanese tuna packers were expected to switch to tangerine canning, indications were that the November export price level of \$400 might decline in the following 2 or 3 months.

Yellowfin tuna were being exported to the United States in limited quantities at c. & f, prices of \$360-370 per short ton. The United States packers were said to be offering to buy Japanese yellowfin tuna because of poor yellowfin landings in the United States and also because they expected a recovery of canned light meat tuna sales in the domestic market.

The price of yellowfin tuna for export to European countries was reported to be advancing. In Italy, where buying was said to be very active, yellowfin (gilled & gutted) were reported being sold at a record high c.i.f. price of \$410 per metric ton.

The high price offered for yellowfin tuna was attributed to inadequate supply. Yellowfin are said to comprise only 20-30 percent of the total Japanese Atlantic tuna landings.

Bluefin, followed by big-eyed, are the principal species being landed by the Japanese long-line vessels but those two species are not popular in Italy. Italy continues to refuse to accept pure shipments of big-eyed. For mixed deliveries of yellowfin and big-eyed, Italy offered a c.i.f. price of \$340 per metric ton, provided shipments did not contain more than 40 percent big-eyed. Czechoslovakia, a steady buyer of big-eyed, was said to be offering c.i.f. prices of \$325-330 per metric ton, and was reported to be likely to continue importing that species of tuna. (Suisancho Nippo, November 11; Suisan Keizai Shimbun, November 10, 1963.)

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FISHERY FIRM APPLIES TO OPERATE TUNA MOTHERSHIP IN ATLANTIC OCEAN:

One of the largest Japanese fishing companies is reported to have submitted a petition to the Japanese Fisheries Agency requesting that the Government authorize mothership-type tuna vessel operations in the Atlantic Ocean. The Agency planned to announce its decision regarding this request after the Central Fisheries Coordination Council meeting in December 1963, at which time licensing requirements for tuna mothership-type operations were expected to be discussed. (Shin Suisan Shimbun Sokuho, November 8, 1963.)

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SHORE FACILITIES IMPROVED AT MALAYSIAN TUNA FISHING BASE:

A Japanese overseas fishing company and the Japan Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN), which are involved in the operation of the Japanese tuna base at Penang, Malaysia, have been making concerted efforts since in early 1963 to improve shore facilities and to attract tuna vessels (ice boats) to fish out of their base. The overseas fishing company has enlarged the existing inadequate cold-storage facilities, and the expanded facilities now include a 1,200-ton capacity cold-storage plant and a 40-ton quick-freezing plant. The company has also established an advance base at Port Luis, Mauritius Island, east of Madagascar, near the principal albacore fishing grounds in the western Indian Ocean. Now catches made in the western Indian Ocean can be unloaded at that port for transshipment to Penang.

Japan (Contd.):

NIKKATSUREN, which financially supported the cold-storage expansion project at Penang, is launching a nationwide drive to solicit Association members to participate in the Penang fishing operation. The Federation has also made arrangements with the Agriculture and Forestry Central Bank (Government-operated) for advancement of loans to cover predeparture expenses and refrigeration equipment installation expenses for participating vessels. (Suisan Keizai Shimbun, October 27; Suisan Shuho, October 15, 1963.)

The Penang base has a 6,000-ton fresh tuna quota and a 4,000-ton frozen tuna quota. Although the base originally started operations in 1960 as a joint (Japanese-Malaysian) canning enterprise, it has, in the last year or so, begun concentrating its effort on promoting and expanding frozen tuna transshipments to the United States. Heretofore, the base has not been able to fulfill its fresh tuna quota due to its failure to attract sufficient ice boats. Ice-boat operators were reluctant to fish out of Penang due to the lack of adequate shore cold-storage facilities at that port and its great distance from the better fishing grounds in the western Indian Ocean. The concerted effort made to improve receiving and holding facilities for fresh fish is intended to overcome apathy of ice-boat operators to fish out of their base.

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TUNA VESSELS BASED AT AMERICAN SAMOA IN DIFFICULTY:

Virtually all Japanese tuna vessels (ice boats) based at American Samoa are reported to be operating at a loss due to a drastic decline in catch rate in nearby waters since early 1963. It was reported that many of those vessels are terminating their operations out of Samoa and are returning to Japan. Consequently, Japanese tuna deliveries to Samoa were expected to fall far short of the Japanese export quota established for that island, and it was reported that the tuna supply shortage already appeared to be threatening United States Samoan canning operations.

Overseas-based Japanese ice boat operators are said to be restudying their operations in an effort to seek a solution to the critical problem confronting them. They are said to be seeking Government authorization

to equip their vessels with freezing equipment, as well as planning to transfer their fishing operations to the Indian Ocean or the Caribbean Sea. (Suisan Tsushin, October 31, 1963.)

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TUNA FEDERATION HOPES TO CONTINUE REFUELING VESSELS AT SEA:

The Japan Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN) is reported to favor the continuance of the program it instituted on an experimental basis in October 1963 of refueling tuna vessels at sea. To eliminate loss of fishing time to its member vessels, the Federation had chartered the 1,500-ton tanker Shimmei Maru to refuel vessels in the central and eastern Pacific Ocean.

The experiment has been criticized by the fishermen's unions, which claim that the extension of fishing trips creates undue hardships on crew members. The Japanese Ministry of Transportation is studying this matter and is said not to be in favor of the continuance of refueling vessels at sea unless other provisions, like food and fresh water, can be furnished at the same time. (Suisan Tsushin, November 20, 1963, and other sources.)

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VIEWS ON PROPOSALS ADVANCED AT FAO-SPONSORED MEETING ON CONSERVATION OF ATLANTIC OCEAN TUNA:

The following editorial on the Food and Agriculture Organization (FAO) sponsored meeting on Atlantic tuna conservation (held at Rome, October 25-30, 1963) appeared in the Japanese fisheries periodical Suisan Keizai Shimbun, dated November 22, 1963.

The translation of the editorial follows:

"A working party organized by the Food and Agriculture Organization to develop conservation measures for the Atlantic Ocean tuna resources recently held its first meeting in Rome. At that meeting, the United States delegation is reported to have strongly criticized Japan's increasing fishing intensity in the Atlantic Ocean and stressed the need for establishing a regulatory agency, similar to the Inter-American Tropical Tuna Commission, to regulate the Atlantic Ocean tuna fishery. To this, the Japanese delega-

Japan (Contd.):

tion is said to have argued that all concerned countries should, first of all, carry out a thorough investigation of resources on a co-operative basis. Apparently, the meeting adjourned without agreement being reached.

"With regard to the regulatory agency, the United States delegation proposed that the expenses for the operation of the agency be shared by member countries in proportion to the quantity of tuna landed by each country. It is understood that a total of US\$1 million would be needed to operate that organization. The annual tuna harvest in the Atlantic Ocean amounts to approximately 150,000 tons, of which Japan accounts for 80,000 tons, France 40,000 tons, and Spain and Portugal 10,000-15,000 tons each. If the expenses were to be shared solely on the basis of catch, Japan's share would exceed \$500,000, which would be financially difficult for her to meet.

"Perhaps the Atlantic Ocean tuna resources will eventually be placed under international management, although, at the present time, the status of those resources is still not well known and tuna catch reports available from the fishing countries are inadequate.

"The United States, in advocating the need for a regulatory agency, claimed that the annual Atlantic Ocean tuna production had increased to about 200,000 tons and attributed the increase to the intensification of Japanese longline fishing effort, adding that the decline in yellowfin tuna has led Japan to pursue albacore and big-eyed tuna. Moreover, the United States asserted that yellowfin and big-eyed tuna taken in the Atlantic Ocean belong to a common stock, which the coastal nations also fish, and intimated that the present intensity of Japanese fishing effort would wipe out the tuna resources in the Atlantic. However, the United States arguments, based solely on her data related to fishery trends, would be meaningless or merely academic unless other countries similarly submit catch statistics compiled under standardized procedures or present data compiled through co-operative investigations.

"It may perhaps be necessary to establish an agency to regulate the tuna fishery. However, it must be preceded by cooperative investigations and compilation of catch reports by which to establish the need for reg-

ulation. That was the reason for organizing the FAO working party. In other words, that party was formed not only to consider catch restrictions but to develop conservation measures for tuna and to promote their rational utilization. At present, there are no concrete data by which to definitely establish the need for regulation.

"The United States maintains that 'unless regulatory measures are developed, the tuna resource will be destroyed.' Japan is a country dependent on fishing and cannot afford to destroy that resource. The United States assertion can only be construed to indicate a lack of respect for the Japanese fishing industry." (Suisan Keizai Shimbun, November 22, 1963.)

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EXPORTS OF CANNED SARDINES, MACKEREL, AND SAURY, APRIL-OCTOBER 1963:

Data compiled by the Japanese joint sales company handling the sales of canned sardines, mackerel, and saury indicate that a total of 996,000 cases of canned sardines, mackerel, and saury were contracted for export

| Japanese Export Sales of Canned Sardines, Mackerel, and Saury, April-October 1962 and 1963 | | | | |
|--|----------------------------|----------|-------|-------|
| Country of Destination | April-October | | | |
| | 1963 | | | 1962 |
| | Sardines | Mackerel | Saury | Total |
| |(In 1,000 Cases)..... | | | |
| Europe | 25 | 11 | 4 | 40 |
| West Africa . . | 1 | 47 | - | 48 |
| Ceylon | - | 18 | 76 | 94 |
| Burma | 60 | 20 | 90 | 170 |
| Malaysia . . . | 2 | 66 | 12 | 80 |
| Philippines . . | 10 | 43 | 239 | 292 |
| New Guinea . . | 3 | 68 | 160 | 174 |
| Other countries | 22 | 3 | 16 | 98 |
| Total . . | 123 | 276 | 597 | 996 |
| | | | | 488 |

during the period April-October 1963. This is more than double the comparable 1962 exports which totaled 488,000 cases. (Suisan Tsushin, November 16, 1963.)

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SAURY LANDINGS DOWN SHARPLY IN 1963:

The 1963 saury fishing season in Japan was reported in early November 1963 as being very poor, with landings down substantially from 1962. Saury production for the period April 1-November 10, 1963, totaled 232,713 metric tons, a decrease of 42 per cent or

Japan (Contd.):

166,728 metric tons below the landings of 399,441 tons made in a comparable period of 1962. Saury catches in the Okhotsk Sea were good, exceeding comparable 1962 landings by nearly 30 percent, but catches off eastern Hokkaido and Honshu (Japanese main island) were down 40-60 percent. Despite the decline in total production, Japanese saury fishermen were reported to have operated profitably in 1963, due to substantial increases in ex-vessel prices as compared to 1962.

Due to poor fishing conditions, Japanese canned saury production in 1963 was expected to decline to an unprecedented low--to about one-twelfth of the 1962 production. Canned saury production as of November 10, 1963, amounted to only 200,000 cases. This compares with a total pack of 2.5 million cases in 1962, 3.4 million cases in 1961, and 1.7 million cases in 1960.

Japanese exporters, following a November 20 meeting, were planning to export to Egypt only about 40,000 cases of canned saury due to the short supply. They hoped to increase saury exports to that country if additional supplies became available. (Suisan Tsushin, November 16 & 20; Minato Shimbun, November 14, 1963.)

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FISH EXPORTERS AFFECTED BY DUTY IMPOSED BY GHANA:

According to information received in Japan from Japanese exporting firms in Ghana, the Government of Ghana issued an ordinance on October 21, 1963, placing an import duty (where there previously was none) of six pence (6.96 U. S. cents) a pound, or about US\$139 a short ton, on fresh and frozen fishery products.

At least two Japanese firms will suffer from the effects of the ordinance. Fishery exports to Ghana of one of the Japanese firms are reported to average about 1,000 metric tons a month. Average prices paid for those exports range from \$180-230 per metric ton. On the basis of those figures, assessment of the six pence per pound import duty will raise that company's export prices by 60-77 percent.

This firm was expected to send a representative to Ghana to report on the situation. (Nihon Keizai Shimbun, October 31, 1963.)

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GOVERNMENT ALLOTS FUNDS FOR FISH MEAL IMPORTS:

The Japanese Ministry of International Trade and Industry (MITI) has approved a foreign fund allocation of US\$9.1 million for the purchase of 70,000 metric tons of foreign fish meal. Japanese importers planning to import fish meal must submit applications for foreign fund allocations to MITI by March 10, 1964. (Suisan Keizai Shimbun, October 29, 1963.)

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FROZEN SHRIMP TRADERS CONCERNED OVER HIGH INVENTORY:

Japanese shrimp importers and distributors were reported to be alarmed over possible price disruptions occurring in the Japanese domestic shrimp market due to heavy frozen shrimp inventories, estimated at over 2,000 tons at the end of October 1963. They expected to be compelled to sell at a loss their stocks of shrimp, much of which they imported at high prices, since the Japanese "Taisho" shrimp season would commence soon after the end of October, and also since new shipments of Mexican shrimp were scheduled to arrive in Japan in mid-November. In addition, there was the possibility that shrimp from Mainland China might be imported if satisfactory price agreements could be reached with that country.

Market prices for frozen shrimp in Japan toward the end of the year and in the early part of the following year are largely determined by the amount of "Taisho" shrimp production in Japan and the quantity of imports. At the end of October, 21-25 count brown shrimp were being traded in Japan for around 2,100 yen (US\$5.83) per 5-lb. carton. Mexican shrimp exporters were said to be offering (for mid-November delivery in Japan) 21-25 count brown shrimp (5-lb. carton for 1,800-1,900 yen (US\$5-5.28).

Consumption of frozen shrimp in Japan is estimated by one trading firm at 500-600 metric tons per month. (Minato Shimbun, October 30, 1963.)

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Japan (Contd.):

NEW FIRM PLANS TRAWLING AND FISH-MEAL OPERATIONS IN ATLANTIC:

A Japanese fishing company, which was organized in early 1963 with a paid-up capital of 15 million yen (US\$41,667), and which voted to increase its paid-up capital to 30 million yen (US\$83,333), is reported to be seeking Government authorization to operate two trawlers (one 990-ton and another 500-ton) in the Atlantic Ocean. Should approval be granted, the company plans to increase further its paid-up capital by 3 or 4 times.

The Japanese firm is also reported to be negotiating with Angolan authorities the re-establishment of a fish-meal venture off Angola. (Suisan Tsushin, November 6, 1963.)

Beginning in the winter 1961/62, another Japanese firm operated the fish-meal factory-ship Renshin Maru (14,094 gross tons) for two seasons off Angola under a year-to-year arrangement whereby Angolan fishermen delivered their catch to the factoryship for processing into fish meal. However, this firm decided to terminate that arrangement in 1963 rather than enter into a permanent partnership and form a joint company in Angola, as requested by Angolan authorities.

COMMERCIAL QUALITY PEARLS PRODUCED FROM FRESH-WATER MUSSELS:

A pioneer in Japan's fresh-water pearl culture industry has succeeded in raising pearls commercially in the fresh-water mussel (Anodonta japonica). The pioneer, who is chairman of the Lake Biwa Pearl Culture Association, carried out his experiments on the black crow mussels at Tauchiura on the large freshwater Kasumigaura Lagoon northeast of Tokyo. Starting in the spring of 1963, he has already harvested cultured pearls 5 millimeters (about $\frac{1}{5}$ inch) in diameter and expects specimens 3 times as large in 3 years. He says that experiments with another type of shellfish found in the same lagoon are promising.

His previous work at Lake Biwa produced large quantities of coreless pearls without nuclei, although only 2 percent were marketable. Raising black crow mussel pearls is much more complex and employs use of a core or nucleus. He anticipates that about

8 percent of this pearl harvest will be marketable for jewelry. He has made arrangements for 4 million live mussels which should yield 7,260 pounds of pearls.

LONG-RANGE FISHERIES MANAGEMENT PROGRAM PLANNED:

The Japanese Fisheries Agency Director at a press conference held on October 28, 1963, revealed that the Agency plans to draw up a blueprint for a broad, long-range fisheries management program covering roughly a 5-year period, beginning from 1967. The long-range program is to be prepared for public release by 1967, when all fishing vessel licenses become renewable. It will show the number and size of fishing vessels to be licensed for each of the designated fisheries, and is expected to take into full consideration the condition of fishery resources, fishing effort, technological developments, international trends, and supply and demand relationships.

According to the Director, the purpose of the program is not to define the requirements for each designated fishery but to develop from an over-all viewpoint a coordinated management program for the Japanese coastal, offshore, and distant-water fisheries, which are intimately related to each other. (Suisan Keizai Shimbun, October 29, 1963.)

PRODUCTION TARGETS AND COMPOSITION OF 1963/64 ANTARCTIC WHALING FLEETS:

Seven Japanese whaling fleets were scheduled to depart Japan in early November to take part in the 1963/64 international Antarctic

| Whaling Fleet | Catch Quota |
|--|------------------|
| | Blue-Whale Units |
| <u>Nisshin Maru</u> | 766.66 |
| <u>Nisshin Maru No. 2</u> | 766.66 |
| <u>Nisshin Maru No. 3^{1/}</u> | 111.83 |
| Total | 1,645.10 |
| <u>Zunan Maru</u> | 710.73 |
| <u>Zunan Maru No. 2</u> | 710.70 |
| Total | 1,421.43 |
| <u>Kyokuyo Maru No. 2</u> | 766.66 |
| <u>Kyokuyo Maru No. 3</u> | 766.66 |
| Total | 1,533.32 |
| Grand total | 4,599.90 |

^{1/}Will fish mainly for sperm whales.

Japan (Contd.):

Table 2 - Composition of Japan's 1963/64 Antarctic Whaling Fleets

| Mothership | Support Vessels | | | |
|------------------------------|-----------------------------------|----------------|---------|-----------------|
| | Freezer Factoryship ^{1/} | Supply Vessels | Tankers | Catcher Vessels |
| Nisshin Maru | 2 | 4 | 1 | 12 |
| Nisshin Maru No. 2 | 3 | 5 | - | 12 |
| Nisshin Maru No. 3 | 1 | - | - | 11 |
| Zunan Maru | 3 | 4 | 1 | 12 |
| Zunan Maru No. 2 | 2 | 5 | 1 | 12 |
| Kyokuyo Maru No. 2 | 2 | 7 | 1 | 11 |
| Kyokuyo Maru No. 3 | 2 | 5 | 1 | 12 |

^{1/}Includes 5 motherships employed in the 1963 salmon fishery, 5 of the larger factoryships employed in the 1963 Bering Sea bottomfish fishery, and 5 other factoryships, some of which were employed formerly in the salmon mothership and tuna mothership fisheries.

tic whaling season which began on December 12, 1963. The production targets and the composition of the seven fleets are found in the tables. (Suisan Keizai Shimbun, September 29, 1963, and Suisan Shuho, September 15, 1963.)

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ANTARCTIC WHALING FLEETS LOOK FOR BETTER OIL MARKET IN 1964:

The success of Japan's 1963/64 international Antarctic whaling expeditions is expected to depend primarily upon the world market for whale oil in 1964. Of the anticipated production, Japan hopes to export 123,000 metric tons of whale oil (Editor's Note: Believed to include liver oil since total Japanese whale oil--not including liver

oil--production target amounts to 98,751 tons), valued at an estimated US\$22.9 million, based on October 1963 world market price trends. In 1963, Japan exported 95,200 tons of oil valued at over \$13 million.

Whale oil prices rose sharply in 1963 and this development has buoyed the hopes of the large Japanese whaling companies which hope to operate their fleets at a profit during the coming season, despite the reduction in the international Antarctic whale catch quota. The Japanese fleets which participated in the 17th Expedition (1962/63) are reported to have lost, on an average, from 200- to 300-million yen (US\$556,000-\$833,000) due to a drastic decline in the world price for whale oil, and also to the decline in price of whale meat.

The 1963 rise in whale oil price is attributed to the decline in production of Peruvian fish oil and of European vegetable oil. As of October, the whale oil market was described as having definitely turned into a sellers' market. Reportedly, in July 1963 Japan sold, from the production of last season's North Pacific whaling operations, 5,000 metric tons of baleen whale oil to an independent European fat- and oil-processing firm for a c.i.f. price of US\$218 per metric ton. This represents a price increase of more than 70 percent over that paid in 1962 for the North Pacific production, which brought \$126 per metric ton. The \$218 price also represents an increase of over 35 percent over the average price (\$176 per metric ton) which a large British processor paid for Japan's

Table 1 - Baleen Whale Production Target of Japan's 1963/64 Antarctic Whaling Expedition

| Fleet | Catch Quota ^{1/} | Oil | Frozen Meat | Salted Meat | Meal | Liver Oil | Extracts |
|--|---------------------------|--------|-------------|-------------|-------|-----------|----------|
| | Blue-Whale Units | | | | | | |
| Nisshin Maru | 761 | 14,471 | 21,438 | 1,164 | 380 | 7,616 | 30,000 |
| Nisshin Maru No. 2 | 761 | 14,471 | 21,438 | 1,164 | 1,560 | 7,616 | 22,000 |
| Nisshin Maru No. 3 ^{2/} | 111 | 2,111 | 3,128 | 52 | 61 | 1,111 | 3,000 |
| Zunan Maru | 706 | 12,708 | 21,180 | 1,151 | - | 6,707 | - |
| Zunan Maru No. 2 | 706 | 12,708 | 21,180 | 1,151 | - | 6,707 | - |
| Kyokuyo Maru No. 2 | 761 | 14,091 | 20,565 | 800 | 1,249 | 8,378 | - |
| Kyokuyo Maru No. 3 | 761 | 14,091 | 19,803 | 692 | 1,447 | 4,570 | 45,700 |
| Total | 4,567 | 84,651 | 128,732 | 6,174 | 4,697 | 42,705 | 100,700 |

^{1/}Japan's catch quota is 4,600 blue-whale units.
^{2/}Will fish primarily for sperm whale.

Table 2 - Sperm Whale Production Target of Japan's 1963/64 Antarctic Whaling Expedition

| Fleet | Catch Target | Oil | Salted Meat | Meal | Liver Oil | Extracts |
|------------------------------|--------------|--------|-------------|------|-----------|----------|
| | No. Whales | | | | | |
| Nisshin Maru No. 3 | 2,100 | 10,200 | 810 | 87 | 21,000 | 128 |
| Zunan Maru | 200 | 1,200 | 272 | - | 2,100 | - |
| Zunan Maru No. 2 | 200 | 1,200 | 272 | - | 2,100 | - |
| Kyokuyo Maru No. 2 | 100 | 750 | 32 | 60 | 1,300 | - |
| Kyokuyo Maru No. 3 | 100 | 750 | 32 | 120 | 1,300 | 7,000 |
| Total | 2,700 | 14,100 | 1,418 | 267 | 27,800 | 7,128 |

Japan (Contd.):

1962/63 Antarctic baleen whale oil production.

The large British processor is reported to be considering offering a c. i. f. price of \$196 per metric ton for Japan's baleen whale oil production. However, since there is no evidence at the present time which would indicate that prices will trend downwards in the near future, Japan is reported to be planning on holding out for a c. i. f. price offer of \$224 per metric ton.

Price of whale meat in 1964 is expected to increase to over 100,000 yen (\$278) per metric ton, as compared to an average price of 78,000 yen (\$217) per ton in 1963. (Suisan Keizai Shimbun, October 27, 1963.)

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JAPAN-COMMUNIST CHINA FISHERIES AGREEMENT:

Japan and Communist China are reported to have signed a private fisheries agreement at Peiping on November 8, 1963, after several weeks of negotiations. The new agreement, which became effective December 23, 1963, is basically patterned after the first private agreement concluded in 1956, which Communist China abrogated in 1958 following the incident at Nagasaki, Japan, in which Japanese demonstrators defamed the Communist Chinese flag.

The new agreement, like the first, provides for the establishment of six fishing areas (numbered 1-6), where limited numbers of fishing vessels from each country would be allowed to fish during certain periods. Primary differences between the two agreements are: (1) extension of the effective period of the agreement from 1 to 2 years; (2) increase in numbers of Communist Chinese fishing vessels permitted to operate in the different fishing areas; and (3) establishment of an 11-month closed season for "sakura" sea bream in Area 4.

Basic provisions of the new agreement are reported to be:

(1) Agreement to become effective 45 days from date of signing, and to continue in force for a period of two years.

(2) Areas covered by the agreement are the Yellow Sea and the East China Sea north of 27° N. latitude and east of the line extending approximately 50 miles off the Chinese mainland.

(3) Establishment of 6 fishing areas.

(4) Establishment of 3 emergency ports of call in Japan for Communist Chinese fishing vessels in distress and 2 emergency ports of call in China for Japanese fishing vessels in distress.

(5) Both countries to conduct resource investigations in areas covered by the agreement and to exchange data.

(6) Japanese fishing vessels to refrain from entering restricted Chinese military zones.

(7) Both countries to settle fishery disputes and fishing violations in accordance with procedures established under agreement.

The signing of the private fisheries agreement with Communist China was heralded by the Japanese fishing industry as a great achievement. Principal and immediate benefit to the Japanese fishermen operating trawlers in the Yellow Sea and the East China Sea is the removal of the constant threat of seizure from Communist Chinese patrol vessels. Anticipation is also held for improved relations with Communist China in the future.

The Republic of Korea (ROK) is reported to be highly critical of the Japan-Communist China private fisheries agreement. The ROK claims that Japan has completely departed from the firm position she has adopted in pressing for a 12-mile exclusive fishing zone (off Korea) in her negotiation with the ROK, whereas, in substance, the Japan-Communist China agreement grants to Communist China a 50-60 mile exclusive fishing zone off the Chinese coast. Reportedly, the ROK's criticism has caused concern among Japanese fishery circles, who fear that Korea misunderstands Japan's intent, and that this development may exert an unfavorable effect upon the current Japan-ROK fisheries negotiation.

The Japanese industry is stressing the point that the agreement was concluded on the basis of equality to protect the fishery resources of the East China Sea and the Yellow Sea and to ensure the safe operation of Japanese vessels. As such, they feel that the ROK-Japan fishery negotiation should also be conducted in this atmosphere. (Minato Shimbun, November 7, 9, & 16; Suisan Keizai Shimbun, November 7, 1963.)

**Republic of Korea**GOVERNMENT GUARANTEES PAYMENT OF THREE PRIVATE FISHERY LOANS:

In late October 1963, the Government of Korea approved payment guarantees for three more fishery loans extended to Korean firms by foreign companies. The funds made available will be used to import tuna vessels.

A guarantee approved on October 22, involves a loan of US\$1,530,342 (including interest) from a United States firm in California. According to previous reports, a Korean firm will use the loan to purchase eleven 140-ton tuna vessels from a shipyard in Shikoku, Japan.

The second guarantee covers a loan of \$1,572,750 by a West German group. The loan will finance the construction of several 135-ton tuna vessels in a West German shipyard. Work on the vessels was tentatively scheduled to begin in December 1963 and be completed in 14 months. The terms of the loan call for repayment in 5 years in semi-annual installments at 6 percent annual in-

Republic of Korea (Contd.):

terest. It has been reported that the loan is to be repaid from "profits from the fish catch," but whether or not such a provision is spelled out in the contract is not known.

On October 28, the Korean Government approved a payment guarantee for a loan under which a United States company in New York is to have eight 135-ton and two 290-ton tuna fishing vessels constructed by a Japanese builder for a Korean firm. The loan is for \$1,540,000 plus \$438,900 in interest charges. Terms call for semi-annual payments over 7 years, after a 1-year deferment, at an interest rate of 6 percent. Provision was made for payments to be made from profits from the tuna catch. The new vessels are to operate in the Indian Ocean after delivery which is expected by September 1964. (United States Embassy, Seoul, November 1, 1963.)

Note: See Commercial Fisheries Review, December 1963 p. 71, October 1963 p. 60.

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NEW FISH MARKET CENTER AT PUSAN DEDICATED:

The United States Agency for International Development (AID) financed Pusan Fish Market Center was formally dedicated on November 1, 1963. This modern facility, which was completed following a number of obstacles since the United States and Republic of Korea project agreement was signed in March 1957 and construction began in July 1961, promises to be an important factor in increasing production of exportable fisheries products and in supplying higher quality products for domestic consumption. The market can handle 865 tons of fish a day. Forty tons of ice can be produced each day and the ice storage capacity totals 650 tons. The daily freezing capacity for fish is 22 tons and 800 tons of fish can be kept in cold storage.

More than ₩184 million (US\$1,415,000) has been invested in the Center. Of this amount nearly ₩70 million (US\$538,000) were provided directly by the United States in dollars and counterpart funds and additional support from United States sources was provided indirectly in the form of fishery fund loans and technical assistance.

Pusan is the most important single home port and market for the 850,000 Koreans

whose income is derived partly or wholly from fisheries and has a large share of the total of 34,000 fishing vessels that operate out of Korean ports. The industry is landing marine products valued at about ₩5.5 billion (about \$42.3 million) annually and provides about 15-20 percent of all of Korea's foreign exchange earnings. (United States Embassy, Seoul, November 5 and 15, 1963.)



Liberia

FREEZING BROADENS MARKET FOR FISH:

The production of 2 million pounds of marine fish in Liberia during the months of July and August of 1963 equalled the total for 1962. Estimates by a Monrovia fishing company are that if the demand pattern continued at this level, about 12 million pounds could be marketed annually provided the landings could be maintained at the July-August rate.

The increased production resulted from the demand created by freezing, packaging, and lower prices. The improvement in processing and in marketing was brought about by the new management of a Monrovia fishing company. The company has contracted the services of Japanese trawlers which trawl off the West African shore.

The catch is packaged in 44-pound cardboard cartons and frozen at sea. Delivered in this condition to the cold-storage facilities in Monrovia, the fish is wholesaled in the frozen packages to buyers, mostly market women, for US\$6 to \$7 per 44-pound box, who distribute them by taxicab, principally. Inland country distribution has increased tremendously. A market woman will take as much as 10 cartons of fish 150 to 200 miles into the interior. The package will remain frozen 15 to 20 hours. The fish, mostly red snappers, are sold immediately. The Monrovia fishing company also operates two insulated trucks for the distribution of frozen fish to inland areas.

Previously, fish caught by the Monrovia fishing company's trawlers (Spanish) was delivered unfrozen in wooden boxes of 22 pounds each to the cold storage in Monrovia where they were chilled, and sold at \$6 to \$7 per box, or double the new price. In this condition and at those prices, little of the fish left the Monrovia area. The decrease in the

Liberia (Contd.):

wholesale price of fish permits retailing at 25 to 30 U. S. cents a pound.

On the basis of the October 1963 wholesale price of 14.8 U. S. cents average, the projected annual value of the fish production would amount to \$1,776,000, with a retail value of about \$3,300,000.

It is expected that this increase in fish consumption in Liberia could reduce imports of protein foods which are retailed at an equivalent price range. Corned beef, pigs feet, and some canned and dried fish are the principal items in this category. This would mean a savings in foreign exchange payments of approximately \$1 million a year.

The main problem confronting the Monrovia fishing and distributing firm is one of supply. The trawlers have not demonstrated a continuous capability of supplying the July-August level of fish catches to Liberia. It is understood that the company has a contract with 4 Japanese trawlers which also supply Ghana and Nigeria. Soviet trawlers also operate in the West African waters, but as far as is known none of the fish caught by the Soviet trawlers reach Liberia.

Another problem is inadequate cold storage capacity in Liberia which will probably be overcome soon. Increased storage capacity will enable Liberia to receive greater quantities at any single delivery. The management of the Monrovia company is expanding and constructing additional facilities in the city, and has plans for inland facilities at Buchanan. (United States AID Mission to Liberia, October 28, 1963.)

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**NEW FISHING COMPANY EXPECTED
TO INCREASE LANDINGS
AND CONSUMPTION:**

The newly formed Liberian fishing corporation has announced the availability of 2,600 shares of common stock at US\$200 per share. Of these, 1,326 shares, or 51 percent, were to be sold to Liberian citizens and other Liberian institutions while 1,274 shares, or 49 percent, could be sold to foreign citizens and institutions.

The purpose of the company is to: (1) supplement the inadequate supply of fresh

fish, (2) stabilize the retail price structure, (3) extend the benefits of the venture to as many Liberians as possible, and (4) provide a reasonable profit to shareholders.

Production figures through August 1963 indicated there would be a significant increase in the domestic catch and consumption of fish during 1963. This will result in part from the improved freezing facilities of a Monrovia fishing corporation and better methods of distribution throughout the country. (United States Embassy, Monrovia, November 30, 1963.)

**Mexico**

**CAMPECHE SHRIMP VESSEL OWNERS
SUFFER FROM LOWER PRICES:**

During October 1963, Mexico's Gulf Coast shrimp industry in the State of Campeche suffered an economic setback caused by a sharp drop in the world price for shrimp. The Campeche newspapers reported that shrimp catches by United States vessels were the largest in recent years and have flooded the United States market. As a result, the price of top quality large shrimp has dropped from US\$0.87 to US\$0.59 a pound. The newspapers further commented that this low price combined with the poor catches by the Mexican Gulf Coast fleet has panicked owners of the shrimp vessels.

An official of a Campeche shrimp-packing firm and an official of an agency representing the American Shrimp Association stated that the industry has always been marked by cyclical depressions every 4 or 5 years and that such crises must be expected. Furthermore, they explained that this is the season when the catches are normally poor in Campeche waters and, unfortunately, it is combined this year with exceptionally good catches by the United States Gulf Coast fleet. They admitted the shrimp prices were low and temporary measures were necessary to lower the costs of the Mexican shrimp vessel owners which have risen steadily in recent years. They believed that the basic problem was the lack of a market other than that of the United States which forced the Mexican industry to fluctuate with the United States market. They said the crisis will last about three months.

In conflict with these opinions was the demonstration on October 25, 1963, of a large

Mexico (Contd.):

fleet of United States shrimp vessels in international waters in front of the port of Campeche. The United States shrimp fishermen apparently believed that the price of shrimp had been artificially lowered and that their action would force the price to rise. The newspapers mentioned that the Mexican shrimp fishermen in Campeche supported the demonstration of the United States fishermen.

The Campeche shrimp-fishing industry provides a livelihood for 14 percent of the State and the Governor of Campeche has moved rapidly to ease the plight of the vessel owners. Apparently because of the Governor's intervention, the cost of many of the products used by the industry and other expenses have been reduced. The price of ice was lowered from US\$6.40 per ton to \$4.80, engine fuel was cut by 0.8 U. S. cents a liter, the handling costs at the pier were reduced 50 percent, and the taxes charged by the State on the catches also were reduced. (United States Consulate, Merida, November 5, 1963.)

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CUBAN FISHING VESSELS INSPECTED FOR HOOF AND MOUTH DISEASE:

All Cuban fishing vessels arriving in Mexican ports in the Yucatan area during the latter months of 1963 were subject to inspection and disinfection by Mexican Sanitary authorities in order to prevent the spread of hoof and mouth disease said to be prevalent in Cuba. These restrictions were applied to all Cuban vessels, both those friendly to the Cuban regime and those coming from Cuba carrying refugees. The inspection was being applied to Mexican vessels which pick up on the high seas and bring to port Cuban refugees. (United States Consulate, Merida, November 1, 1963.)

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FISH MEAL IMPORTS UP SHARPLY, JANUARY-SEPTEMBER 1963:

Mexico's imports of fish meal amounted to 21,006 metric tons during the first nine months of 1963. Only 13,545 tons were imported in the same period of 1962. (United States Embassy, Mexico City, November 9, 1963.)



Morocco

FISHERIES TRENDS, THIRD QUARTER 1963:

Optimistic reports marked Moroccan fishing operations during the third quarter of 1963 which is normally the height of the fishing season. The sardine catch was running at about twice the usual amount, with the ports of Safi and El Jadida experiencing record one-day landings (1,600 metric tons and 500 tons, respectively). The quality of the sardines has, however, been below normal. As a result, fish-meal production has increased markedly, while canners are generally behind schedule.

During the July-September 1963 quarter, export prospects for Moroccan canned sardines improved. The decline in Portuguese production in the first half of 1963 helped create a more favorable competitive export position for Moroccan canners and this development was expected to increase sales.

The periodical, Maroc-Informations, in its issue of July 14-15, 1963, observed that the key to the problems of the Moroccan fishing industry is a reduction in fish export prices, which were estimated at 25 to 30 percent above world market prices. The solution advocated by the journal was modernization of the fishing fleet and fish-processing industry. A start in this direction has been taken in Tangier where US\$300,000 is being invested in a tuna cannery. The new cannery, which will not be in full operation until mid-1964, will have to use foreign tuna since landings by the local fishing fleet would not sustain capacity operation.

A French electronic fish-sounding device has been undergoing tests at Safi. If the sonar device is successful in locating schools of sardine, the new technique will be introduced in the fishing fleets of the major Moroccan fishing ports. (United States Embassy, Rabat, October 25, 1963.)

Note: See Commercial Fisheries Review, November 1963 p. 75.



New Caledonia

JAPANESE TO EXPAND TUNA FISHING BASE:

One of the large Japanese fishing companies, which is operating a tuna-fishing base at Noumea, New Caledonia, jointly with a French

New Caledonia (Contd.):

firm is reported to be planning on constructing refrigeration facilities on that island in the near future. The facilities will include a 2,000-ton capacity cold storage, 70-ton capacity freezer, 40-ton ice-making plant, and a 1,500-ton capacity ice-storage plant.

Iced tuna delivered to the Noumea base are frozen aboard the Japanese freezer ship Eiyo Maru (2,600 gross tons) anchored at that port. The base has an annual export quota of 7,500 metric tons of frozen tuna, (Suisan Keizai Shimbum, November 15, 1963.)



Nicaragua

U. S. FISHERIES FIRM BEGINS SHRIMP PROCESSING AT EL BLUFF:

A Chicago fisheries firm has begun operations at the shrimp processing plant it recently purchased at El Bluff near Bluefields on the Caribbean coast. A Nicaraguan entity holds 10 percent of the stock and has an option on an additional 35 percent which has now been placed on the market for sale to Nicaraguans.

An official of one of the Chicago firm's shrimp processing plants went to Nicaragua to supervise the reorganization and new construction that was required at the plant. He plans to stay there until the plant is operating satisfactorily, at which time he will divide his time in alternate two-week periods between the El Bluff plant and another plant outside that country. A Nicaraguan manager will handle routine plant operations and all other personnel are local people.

The Chicago firm's representative has indicated that both he and company officials have been gratified and encouraged by the results of their operations in the 6 weeks since they have begun. They were able to locate and correct operational difficulties experienced by the former owners which strengthened their earlier opinion that the plant was not nearly as well designed and managed as it might have been. A great part of the former owners' investment in the plant went to correct faults in its original design. Freezing and processing buildings were located at a distance of some hundreds of yards from the sea and an expensive fill operation had to be undertaken to build the necessary road beds and railroad tracks over the swampy ground. These extravagances by the former owners were coupled with abortive attempts at economy that eventually cost the bankrupt firm in terms of both efficiency and money. They used, for instance, a cheaper ammonia that cut down their freezing capacity, and bought a used ice crushing machine that was entirely inadequate for their needs. Their maximum ice production was 15 tons in a ten-hour period. This bottleneck required vessels to spend an inordinate amount of time in port waiting for their ice supplies to be replenished. The new owners immediately began using a better grade of ammonia in the ice plant and bought a new ice crusher. Within the first two weeks of their operation, they increased ice production to 13 tons hourly and can now unload and reprovision ships with minimum loss of time in port.

The original owners had spent large sums on management housing, machine shops, road beds, and railroad tracks but had not built sufficient storage facilities. They

could not store more than 100,000 pounds of frozen shrimp at one time, which is not enough to provide an economic load for a refrigerated ship. The new management is constructing additional storage facilities and is making changes in the plant's layout which they expect will contribute to its efficiency. The plant was formerly open on three sides and sanitary requirements were not sufficiently rigorous to permit cleaned shrimp to pass United States' Health Authorities entrance requirements. There were no sanitary facilities at all for employees in the plant. The new management is importing stainless steel tables and instructing its employees in more advanced sanitary techniques so that the plant will be able to pass most rigid United States' sanitary requirements.

Quick freezing facilities can freeze 4,000 pounds every four hours to the existent capacity for conventional 24-hour freezing. Two new Diesel engines from the United States have been purchased to supplement equipment already installed which is of French make. Equipment is on order for cleaning and packing spiny lobster meat and fish filets, and they hope to install a dry freezing operation and bread-ing plant in the future.

In its first 6 weeks the new owners have frozen and shipped 300,000 pounds of shrimp. In its two and one-half year history, the original owners never processed more than 950,000 pounds in any one year and the operation had required a minimum of 100,000 pounds monthly to meet costs. The new owners estimate that they will process 250,000 pounds monthly during the first year of operation and they expect a yearly production of 5 million pounds within a reasonably short period.

Employment in the plant proper as of November 1963 was 100 persons and the operation now has 20 vessels fishing with 5-man crews. The vessels have United States captains and are of United States registry. As soon as all improvements are completed, they will have 35 vessels and 300 employees at the plant. When that level is reached, they will require a subsidiary shipyard to service the fleet, which will employ additional people.

A second shrimp processing plant is under construction at Schooner Key near Bluefields which has applied for permits for 40 vessels. The new owners of the El Bluff plant estimate that their company will eventually create some 2,000 jobs directly or indirectly in the Bluefields and El Bluff area. (United States Embassy, Managua, November 30, 1963.)



Norway

ANTARCTIC WHALING INDUSTRY ENCOURAGED BY HIGHER OIL PRICES:

Attracted by the higher fall 1963 prices for whale oil (close to £80 or US\$224 per long ton as compared with £65 or \$182 in the 1962/63 season) and higher prices for whale meat (£35 or \$98 as compared with £25 or \$70) all four Norwegian whaling expeditions are participating in the 1963/64 Antarctic whaling season.

The total number of expeditions from all nations will be 16, or one less than the 1962/63 season. This year's quota is 10,000 blue whale units, or the equivalent of about 200,000 tons of oil. However, marine biologists have ex-

Norway (Contd.):

pressed some doubts about achieving that figure, and they estimate that possibly only 150,000 to 160,000 tons will be produced. (United States Embassy, Oslo, October 16, 1963.)

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EXPORTS OF CANNED FISHERY PRODUCTS, JANUARY-JUNE 1963:

Norway's exports of canned fishery products in January-June 1963 were down 14.0

oil. Smoked small sild sardines in oil, however, continued to be Norway's most important canned fish export, accounting for 43.0 percent of the quantity and 35.8 percent of the value of total exports of canned fishery products. Combined exports of smoked small sild sardines in oil, smoked brisling in oil, and kippered herring accounted for 72.4 percent of the quantity and 69.8 percent of the value of Norway's exports of canned fishery products in the first half of 1963. The leading buyers of Norwegian canned fishery products continued to be the United States and the Unit-

Table 1 - Norwegian Exports of Canned Fishery Products by Type, January-June 1963

| Product | June | | | January-June | | |
|---|-------------|--------------|-----------|--------------|--------------|-----------|
| | Quantity | Value | | Quantity | Value | |
| | Metric Tons | 1,000 Kroner | US\$1,000 | Metric Tons | 1,000 Kroner | US\$1,000 |
| Smoked brisling in oil | 284 | 1,964 | 275 | 2,224 | 15,559 | 2,176 |
| Smoked brisling in tomato | 42 | 235 | 33 | 139 | 778 | 109 |
| Smoked small sild in oil | 510 | 2,131 | 298 | 5,552 | 23,338 | 3,264 |
| Smoked small sild in tomato | 66 | 235 | 33 | 590 | 2,116 | 295 |
| Unsmoked small sild in oil | 22 | 74 | 10 | 112 | 391 | 55 |
| Unsmoked small sild in tomato | 3 | 10 | 1 | 15 | 56 | 8 |
| Kippered herring (Kippers) | 162 | 684 | 96 | 1,570 | 6,539 | 914 |
| Mackerel | 20 | 95 | 13 | 330 | 1,557 | 218 |
| Roe, unclassified | 292 | 737 | 103 | 789 | 2,821 | 395 |
| Soft herring roe | 96 | 485 | 68 | 473 | 2,293 | 321 |
| Fish balls | 29 | 72 | 10 | 270 | 700 | 98 |
| Other canned fish | 17 | 127 | 18 | 86 | 641 | 90 |
| Shellfish | 139 | 1,512 | 211 | 766 | 8,330 | 1,165 |
| Total | 1,682 | 8,361 | 1,169 | 12,916 | 65,119 | 9,108 |

Table 2 - Norwegian Exports of Canned Fishery Products^{1/} by Country of Destination, January-June 1963

| Country of Destination | June | | | January-June | | |
|---------------------------------|-------------|--------------|-----------|--------------|--------------|-----------|
| | Quantity | Value | | Quantity | Value | |
| | Metric Tons | 1,000 Kroner | US\$1,000 | Metric Tons | 1,000 Kroner | US\$1,000 |
| Finland | 4 | 26 | 4 | 59 | 392 | 55 |
| Sweden | 71 | 318 | 44 | 156 | 817 | 115 |
| Belgium-Luxembourg | 21 | 100 | 14 | 345 | 1,632 | 228 |
| Ireland | 7 | 30 | 4 | 130 | 414 | 58 |
| France | 30 | 116 | 15 | 149 | 617 | 86 |
| Netherlands | 14 | 43 | 6 | 92 | 320 | 45 |
| United Kingdom | 368 | 1,542 | 216 | 2,337 | 9,839 | 1,376 |
| Japan | 22 | 107 | 15 | 170 | 800 | 112 |
| West Germany | 67 | 243 | 34 | 337 | 1,258 | 176 |
| East Germany | - | - | - | 982 | 3,532 | 494 |
| South Africa Republic | 84 | 380 | 53 | 671 | 2,806 | 392 |
| Iraq | - | - | - | 7 | 27 | 4 |
| Canada | 24 | 163 | 23 | 331 | 2,019 | 282 |
| United States | 665 | 3,532 | 494 | 5,566 | 29,349 | 4,105 |
| Australia | 118 | 427 | 60 | 713 | 2,841 | 397 |
| New Zealand | 46 | 212 | 30 | 246 | 1,060 | 148 |
| Other Countries | 62 | 243 | 34 | 527 | 2,010 | 281 |
| Total ^{2/} | 1,603 | 7,482 | 1,046 | 12,818 | 59,733 | 8,354 |

^{1/}Does not include exports of canned shellfish.

^{2/}Totals are slightly larger than the combined exports of canned fish (excluding shellfish) shown in table 1.

Note: Norwegian kroner 7.15 equals US\$1.00.

percent in quantity and 13.3 percent in value from those in the same period of 1962, due mainly to smaller shipments of kippered herring and smoked small sild sardines in

ed Kingdom. (Norwegian Cannery Export Journal, October 1963.)

Note: See Commercial Fisheries Review, January 1963 p. 109.

* * * * *

Norway (Contd.):

WITHDRAWAL FROM WHALING CONVENTION PROPOSED AGAIN:

A Sandefjord, Norway, newspaper which often reflects the views of the whaling industry, has recently advocated that the Norwegian Government withdraw from the International Whaling Convention. According to this newspaper, the Soviet Union has pursued a policy of procrastination for 8 years regarding the signing of the agreement permitting international inspectors to be on board whaling vessels in the Antarctic. The Soviets do not want international inspectors to be in a position to ascertain whether the agreements on quotas and catching seasons are observed, nor do Soviet authorities want to reject the control agreement outright, the newspaper stated. (United States Embassy, Oslo, October 26, 1963.)



Okinawa

TUNA FISHING FLEET INCREASING:

The Okinawan tuna-fishing fleet, which has steadily grown in recent years, is now said to total 25 vessels, aggregating 5,962 tons in gross vessel tonnage. By size, they consist of 14 vessels in the 100-200 ton class; 3 in the 200-300 ton class; 5 in the 300-400 ton class; and 3 over 400 tons. Of the 25 vessels, 11 are operating out of Okinawan ports, 12 in distant waters under contract to Japanese firms (includes 7 in the Atlantic Ocean, 3 in the Indian Ocean, and 2 in the Pacific Ocean based at Espiritu Santo, New Hebrides). Two vessels are scheduled to operate out of American Samoa. (Suisan Tsushin, November 6, 1963.)



Pakistan

EXTENSION OF TERRITORIAL WATERS TO 12 MILES ADVOCATED:

Pakistan's Director of Marine Fisheries strongly advocated the extension of Pakistan's territorial waters from the present 3-mile limit to 12 miles. The Director pointed out that Iran had already extended her limits to 12 miles and India to 6 miles. Since Pakistan's fishing industry is undergoing rapid development and expansion, an extension of

territorial waters would increase the fishing area available for exclusive exploitation by Pakistan and would limit Iranian access to fishing grounds in West Pakistan and Indian access in East Pakistan. (United States Embassy, Karachi, November 9, 1963.)



Peru

FISH MEAL INDUSTRY TRENDS, THIRD QUARTER 1963:

By the end of the third quarter of 1963, Peru's booming fish meal industry was feeling the impact of an unusually poor fishing season. Large stocks of fish meal were on hand at a time of slack demand, and the industry was faced with restricted bank and vendor credits. Inasmuch as the fish meal industry had become Peru's largest foreign exchange earner, a major employer, the basis of a vessel-building industry, and the user of millions of dollars worth of goods and services, the impact of stagnation was felt in many quarters. Importers were particularly hard hit, having sold heavily on credit to the fish meal plants. Commercial banks, finding themselves too heavily committed in a sluggish industry began restricting credit to a completely credit-based industry.

The financial structure of the Peruvian fishing industry and its satellite industries was subject to increasingly close scrutiny during the third quarter of 1963. In mid-1963, a situation of financial stringency developed in the fish meal industry somewhat paralleled to the situation prevailing three years ago, but with the important difference that the industry has not suffered from declining world market prices and speculation, as it did in 1960. After more than two years of overexpansion, when producers built new plants or extended existing ones and purchased new equipment and fishing vessels instead of taking advantage of good production and sales to pay debts and accumulate reserves, many elements of the industry found themselves heavily in debt, without working capital, and with sharply-curtailed bank credit. A study of the financial situation during the third quarter by a fisheries publication showed investment in the fish meal industry of nearly US\$190 million, of which US\$37 million represented invested capital, the remainder representing credits from banks, national and foreign suppliers, and national financing firms.

Although the long-term prospects of the fish meal industry continue to be bright, it has been estimated that it will take 6 months to a year for the industry to overcome its current financial problems, during which time many small plants may have to close for lack of working capital. The more substantial companies, which are better organized and controlled, probably will survive. A start was made toward consolidation of the debts of the industry when, through the efforts of its representatives, it received a US\$10 million loan from a United States bank. Although this is a small sum in relation to a total estimated indebtedness of US\$150 million, it constitutes a beginning. The Banco Industrial del Peru is handling loan operations for the United States bank, and reportedly has received 100 applications for loans from fisheries enterprises. Meanwhile, a coordinating committee has been formed to propose corrective long-term action and cope with some of the industry's immediate problems. This body will endeavor to consolidate the financial position of the industry by arranging medium and long-term loans as well as safeguarding price stability by keeping production in line with the development of new markets. Another factor of vital importance to be dealt with is a more rational control of production costs.

Peru (Contd.):

Production of fish meal in 1963 probably will be considerably less than that earlier predicted (a possible 1.2 million metric tons has been mentioned) in view of a lengthy strike of anchovy fishermen in February and March, followed by a scarcity of anchovies between June and October. Anchovies began to reappear to some extent late in September, but fishing did not return to normal as soon as anticipated. Despite curtailed fishing for extended periods during the year, it is considered likely that Peru's fish meal exports for 1963 will be in excess of the 1,070,000 metric tons exported in 1962. (United States Embassy, Lima, November 19, 1963.)



Philippines

CANNED MACKEREL AWARD:

The Philippine National Marketing Corporation (NAMARCO) has reported that winning bids have been determined for the mackerel tender issued in the fall of 1963. Of a total of 330,000 cases, 125,000 were to be purchased from United States suppliers for over \$825,000 (c. & f. Manila without congestion surcharge). Five United States firms participated. (United States Embassy, Manila, November 18, 1963.)



Portugal

CANNED SARDINE SUPPLY REPORTED ADEQUATE TO MEET DEMAND:

Reports from various sources have mentioned that the Portuguese canned sardine industry was faced with a catastrophic fish shortage in 1963. Various Portuguese sources have indicated conflicting estimates of the total landings expected in 1963 and the late 1963 status of the canned fish industry, but none felt there is any really serious shortage of fish or that the industry will have difficulty supplying customary export markets. However, the fish landings were below average for the first nine months of 1963 and the canners were buying a smaller proportion of the available supply. Some comparative figures are shown in table.

While the January-September 1963, sardine landings were down about 15 percent from the similar period of 1962, the drop was not considered overly large by either the fishing or canning industries. The much

| Portuguese Canned Sardine Production and Exports and Sardine Landings, January-September 1962-63 | | | |
|--|---------------------|--------|---------|
| Product | January-September | | Decline |
| | 1963 | 1962 | |
| | (1,000 Metric Tons) | | % |
| Sardines: | | | |
| Canned | 19,819 | 30,783 | 35.6 |
| Exports | 32,282 | 36,302 | 11.1 |
| Landings, Jan.-Sept. . | 1/59,314 | 69,781 | 15.0 |
| 1/Estimated. | | | |
| Source: Production and export data: Portuguese Institute of Canned Fish, Catch data: <u>Boletim Mensal</u> . | | | |

larger decrease in the packs of canned sardines was also said to be of little concern because of accumulated stocks.

A spokesman for the Institute of Canned Fish explained that all sardines are sold at auction immediately after they are brought ashore. Canners know how much they can pay and still compete in the international canned fish market. When dealers who supply fresh sardines to local consumers go above that price, the canners generally drop out and wait for a drop in the price. The spokesman stated he was certain the canners would bid for sardines if they thought they might lose an export market because of being unable to deliver. (United States Embassy, Lisbon, November 29, 1963.)



Senegal

FISH LANDINGS UP SHARPLY IN 1962:

In contrast to other segments of the Senegalese economy, the fishing industry prospered in 1962. Between 1959 and 1962 annual landings increased from 73,220 metric tons to 102,656 tons. Landings from traditional fisheries jumped from 63,000 tons to 87,594 tons. Tuna landings rose to 11,078 tons from 9,880 tons, and trawler landings from 340 tons to 3,984 tons. Fish canneries processed 4,695 tons in 1959 and 9,508 tons in 1962. (United States Embassy, Dakar, October 26, 1963.)



Somalia Republic

DELEGATION STUDIES

UNITED STATES FISHING INDUSTRY:

The U. S. Agency for International Development (AID) has sponsored a visit to the

Somalia Republic (Contd.):

United States by a top-level fishing industry team from the Somali Republic. The project reportedly involves a cross-section study of the United States fishing industry, including observations of harvesting, handling, processing by canning, freezing, drying and other curing methods, packaging, warehousing, and distribution. The Somali fishing delegation was said to have a special interest in the United States tuna industry, and the study was to take the group from Boston, Mass., to Southern California. The study team, accompanied by AID personnel, began its tour on November 8, 1963, and expected to complete its visit on January 3, 1964. The team was comprised of representatives of Government and industry.

**South Africa Republic****FISH MEAL ASSOCIATION
CONTRACTS TO SELL TO JAPAN:**

The Chairman of the South African Fish Meal Producers' Association reported in October 1963 that a contract to sell R2 million (US\$2,784,000) worth of fish meal to Japan before the end of 1963 was concluded between his Association and the Japanese Importers' Association. The Chairman stated that this was "by far" the largest fish meal contract yet arranged with Japan, and added that negotiations were already under way for expected exports of R6 million (\$8,352,000) to Japan in 1964. (United States Embassy, Pretoria, October 17, 1963.)

**Sweden****EXPERIMENTAL MID-WATER PAIR-
TRAWLING FOR LARGE
HERRING SHOWS PROMISE:**

For some years, west coast fishermen of Sweden have fished herring in the North Sea with the mid-water trawl and bottom trawl, but it has always been believed that the large Icelandic herring would swim too fast to be caught in this way. A former Swedish fisherman, who is now Secretary of the Swedish West Coast Fishermen's Association, has thought otherwise. In 1963, he was able to put his theory to the test and it would seem he has been proved right.

In order to mount the experiment adequately, it was necessary to guarantee the fishermen equivalent earnings to those they could expect at that time of the year, when good fishing is expected in the North Sea. This guarantee was met by the Association's funds with the overhead costs of the expedition paid by the Government.

Four pairs of modern cutters took part. They were from 85-100 feet long and with engines of 600-800 hp. The nets used were modified Larsen type trawls of the kind normally used in the North Sea. All vessels were fitted with echo sounders, and two also had sonar sets. Fishing was carried out off the Icelandic coast, and the duration of the trip was five weeks.

Neither the weather nor the quantity of herring available were as good as expected, but small traces were found in 8-15 fathoms and these were fished. The quantity of fish obtained from these small traces came as a considerable surprise to the fishermen, who were accustomed to much heavier markings in the North Sea. Altogether 2,000 barrels were landed by the four pairs of cutters, and in view of the unfavorable weather and poor echo traces, this was better than had been expected.

As a result of the recent success of Norwegian and Icelandic purse seiners in the Icelandic herring fishery, there is some conjecture as to how much better this catch would have been given better knowledge of the grounds, favorable weather, and a sonar on each vessel, operated by a man trained in its use, as are the Icelanders. Next experiments in 1964 may provide the answers to these questions. (World Fishing, November 1963.)

**Taiwan****FISHERIES TRENDS, THIRD QUARTER 1963:**

According to the Taiwan Provincial Fisheries Bureau, fisheries production during the third quarter of 1963 amounted to 97,131 metric tons. During the July-September 1963 quarter, the deep sea fisheries produced 22,519 tons; inshore fisheries, 45,715 tons; coastal fisheries, 8,315 tons, and fish farming, 20,582 tons.

Fisheries production from all sources in the first 9 months of 1963 amounted to 266,877

Taiwan (Contd.):

tons. The total production would have been greater except for losses due to January's frost, the spring drought, and September's typhoon.

The September 1963 typhoon damage to the fishing industry amounted to about NT\$10 million (US\$248,000), not including loss in expected catch. Most of the damage was sustained by fish harbor facilities and fresh-water fish ponds.

During the third quarter of 1963, success was achieved in the artificial spawning of Chinese carp. Although still experimental, it was the first time fish culture authorities have been able to obtain large numbers of fry by the use of hormones to induce spawning. This operation will be expanded on a commercial scale in 1964 which may make it unnecessary to import the usual US\$100,000 worth of carp fry each year.

On September 27, 1963, the International Bank for Reconstruction and Development and the Taiwan Government signed an agreement calling for a US\$7.8 million loan to finance the foreign exchange construction costs of 16 deep-sea fishing vessels (thirteen 300-ton vessels and three 1,000-ton vessels). About 238 tuna boats now operate out of Taiwan and land an annual catch of about 9,000 metric tons of tuna. During the July-September 1963 quarter, a United States firm renewed its negotiations with the Kaohsiung Fishermen's Association for contracting Chinese fishing companies to fish in waters of American Samoa.

The Taiwan Provincial Government decided that the price of Diesel oil for fishing boats would be reduced on November 1, 1963, by NT\$192 (\$4.80) (including reduction in commodity tax collection) per 1,000 liters. This reduction should help cut the cost of operation of trawlers and all inshore boats using Diesel engines. (United States Embassy, Taipei, November 20, 1963.)

Note: See Commercial Fisheries Review, November 1963 p. 80; August 1963 p. 107; and January 1963 p. 117.



Thailand

LIFTING OF BAN ON FISH IMPORTS BY MALAYA REQUESTED:

The Director-General of Thailand's Fishery Department reported on October 26, 1963, that the Ministry of Agriculture had requested the Ministry of Foreign Affairs to open negotiations with Malaysia for a relaxation of the Malaysian ban on imports of Thai fish. The ban, originally imposed because of a cholera epidemic in some parts of Thailand, has remained in effect despite the end of the epidemic conditions.

In the past, close to 60 percent of the fish consumed in Malaysia came from Thailand. The Director-General reported that a great increase in the smuggling of fish into Malaysia from Thailand has followed the imposition of the ban, resulting in a considerable loss to Thailand in export taxes. (United States Embassy, Bangkok, November 21, 1963.)



Tunisia

DETENTION OF ITALIAN FISHING VESSELS:

Two Italian fishing vessels were escorted into port by the Tunisian Coast Guard on October 22, 1963. The Italian vessels were said to have violated the Italian-Tunisian fisheries agreement concluded early in 1963. Specifically, it appeared that the trawlers were charged with fishing in the Gulf of Gabes inside the 50-meter (about 27 fathoms) depth line, an area in which Tunisia claims exclusive fishing rights. (United States Embassy, Tunis, November 2, 1963.)

Note: See Commercial Fisheries Review, January 1963 p. 119.

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FISHING VESSELS TO BE BUILT IN YUGOSLAVIA UNDER ECONOMIC AID PROGRAM:

A series of economic and technical assistance documents were signed in Tunis on October 23, 1963, by the Director of the Budget in the Ministry of Plan and Finance, and the Director of the Africa-Near East Office of the Yugoslav Secretariat of Foreign Commerce. The signing took place following the second meeting of the Yugo-Tunisian Mixed Commission established by the Economic Assistance Agreement of February 2, 1962, the

Tunisia (Contd.):

first having been held in Belgrade July 17-20, 1962. It is understood that the Commission was chiefly concerned with the utilization of the US\$5 million credit extended by the 1962 agreement, and with the implementation of the August 24, 1961, agreement on technical and scientific cooperation.

According to the communiques issued at the end of the talks, more than one-third of the credit, repayable over 8 years with 3 percent interest, has now been either expended or obligated. Items mentioned as falling within this portion of the credit included a newly placed order for 10 steel-hulled, fishing vessels from the Yugoslav trade organization (Brodoimpeks). Under the terms of a contract signed October 26, 1963, the vessels are to be delivered within 14 months. Brodoimpeks will provide technical training in Yugoslavia for marine engineers and radio operators for the fleet and will furnish a consulting engineer to the Office National des Peches (ONP) for an unspecified period. The vessels will be equipped with sonar, radio, and refrigeration units.

Utilization of the Yugoslav credit has proceeded slowly. Twenty-one months after the signing of the agreement there was no firm evidence that any substantial amount of equipment had actually arrived. (The five 60-ton seiners reported as having been delivered under the credit in August, 1962, now appear to have been the result of a barter-purchase in the context of the bilateral trade agreement concluded on March 19, 1962.)

It is not expected that Yugoslav assistance will fill all the needs of Office National des Peches. This office has expressed interest in engineering services that United States firms might render for the setup of maintenance shops at Bizerte, Mahdia, Sousse, Sfax, and another one in southern Tunisia. The needs of ONP include two trawlers for Atlantic fishing, a total of 100 fishing vessels, marine motors, and radio equipment. (United States Embassy, Tunis, November 16, 1963.)



United Kingdom

FISHERY LOANS INTEREST RATES REVISED:

The British White Fish Authority announced that, as a result of changes in the rates of in-

terest charged to them, their own rates on advances made from October 12, 1963, would be as follows:

Vessels, new engines, nets and gear: on loans for not more than five years, 5 percent (decrease $\frac{1}{8}$ percent); on loans for more than five years but not more than 10 years, 5 percent (decrease $\frac{1}{4}$ percent); on loans for more than 10 years but not more than 15 years, $5\frac{3}{8}$ percent (decrease $\frac{1}{8}$ percent); on loans for more than 15 years but not more than 20 years, $5\frac{3}{8}$ percent (no change).

Processing plants: on loans for not more than 20 years, $6\frac{1}{2}$ percent (no change). (Fishing News, October 25, 1963.)

Note: See Commercial Fisheries Review, August 1963 p. 112.

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FLEET OF FREEZERSHIP-TRAWLERS EXPANDING:

Another freezership-fishing vessel is on order for Hull, England. The subsidiary of a large fishing company has placed the order for the new vessel with a shipyard in Aberdeen. The new vessel will be a 242-foot Diesel-electric stern trawler with a capacity of 500 tons of frozen fish. The £500,000 (US\$1.4 million) 2,700-brake horsepower vessel is expected to be delivered by the spring of 1965.

The expanding all-freezer fleet at Hull has caused the dock authorities to have second thoughts on the whole future of this trend and a plan has already been examined for coping with the future requirements of the port's growing all-freezer fleet. (World Fishing, November 1963.)

* * * * *

IMPROVED-TYPE UNDERWATER TV CAMERA TO AID IN MARINE RESEARCH:

As an aid to its current research program into the general behavior and spawning habits of fish, scientists at the British Lowestoft Fisheries Laboratory are to use a Marconi television camera able to operate on the sea bed.

The equipment ordered by the Laboratory is completely automatic in operation, and can be enclosed, with its control unit, in a pressure casing on the seabed without adjustments of any kind having to be made. A single supply of electrical power runs the entire channel on the seabed, and the output television

United Kingdom (Contd.):

signal is in a final form which can be carried over an almost unlimited length of cable to scientists on the surface. As a result, they will be able to study the fish and operation of trawls as much as 12,000 feet away from the ship on a 21-inch television monitor screen. The pressure casing to contain the equipment will be designed and built by the Fisheries Laboratories at Lowestoft.

The great depth at which this study can be made is possible only because of the extreme stability of this camera channel in unattended operation, and its ability to give excellent pictures at very low light levels. In all previous underwater television work the camera control unit has been installed in the vessel with only the camera head itself on the seabed.

The length of cable connecting the camera to its control unit, and hence, the maximum operating depth of the system has been limited in the past to about 1,000 feet, because of the delay imposed on the essential synchronizing pulses which control the camera, but which are generated in the control unit. With this new camera, however, the on/off switch is the only control used in the entire channel once the equipment has been set up. (World Fishing, October 1963.)

* * * * *

SIXTEEN NATIONS INVITED TO
CONFERENCE ON FISHERIES PROBLEMS:

The British Government invited its six European Free Trade Association (EFTA) partners and the six European Economic Community (EEC) countries to a fisheries conference which opened on December 3, 1963, in

London, Iceland, the Irish Republic, and Spain also attended the conference. The talks were expected to last about four days.

The purpose of the 16-nation meeting was to consider trade in fish. An important question was that of fishing limits.

The former British Lord Privy Seal stated in the House of Commons in April 1963 that other subjects, such as the conservation of fisheries, would also be discussed.

A London newspaper, commenting on possible results of the conference, said that while no final common policy was likely, the talks could lay the groundwork for a fisheries policy. The EEC had not worked out a fisheries policy of its own and was not prepared to undertake any commitments until it had done so.

The newspaper also stated that the British made it clear to the countries invited to the conference that they were concerned about the tendency of countries to extend their territorial waters. These extensions are said to have imposed heavy hardships on British deep-sea fishing fleets. The British thus feel obliged to consider strengthening the rights of their own fishermen in British waters.

To maintain freedom of action, Britain has indicated that she will no longer participate in the North Seas Fisheries Convention of 1882, which binds parties to the Convention to a three-mile fishery limit. Britain will cease to be bound to this after June 24, 1964.

In holding the conference before the June date, the newspaper stated Britain hoped that the countries concerned would be able to work out a satisfactory settlement. (EFTA Reporter No. 86, November 12, 1963.)



Foreign Fisheries Briefs

EAST GERMAN FISHERY RESEARCH VESSEL PARTICIPATES IN JOINT PROJECT:

The East German research vessel Ernest Haeckel, commissioned in May 1963, was reported to be in the North Atlantic off Labrador doing oceanographic research and exploratory fishing. Now on its third voyage, the vessel, equipped with the latest electronic equipment, previously explored fishing grounds in the North Sea. This research is in partial fulfillment of a July 28, 1962, tripartite agreement on fishery research and oceanography between East Germany, Poland, and the U.S.S.R. (Unpublished sources.)

SOVIETS PARTICIPATE IN INDIAN OCEAN TUNA FISHERY:

Soviet tuna-fishing vessels are reported operating in the Indian Ocean and making good catches. The tuna fleet is accompanied by a research vessel equipped to conduct both oceanographic work and exploratory fishing. The flagship of the fleet, the Nora, a Japanese-built vessel, has been extensively remodeled to increase its carrying capacity. (Unpublished sources.)

SOVIET FISHING VESSELS MAY BASE AT TRINIDAD:

According to the captain of the Soviet medium trawler Obraztsov, Port-of-Spain, Trini-

dad, may become a regular port of call for Soviet vessels operating in the Caribbean Sea area. The Soviet fishing vessel anchored in the harbor of Port-of-Spain on October 24, 1963, and remained there for several days while arrangements were being made for representation by a local agent. The captain reported that the vessel had been fishing with about 15 others in the Caribbean Sea and adjacent waters off Mexico and Cuba and was returning to its home port of Kaliningrad on the Baltic Sea. (Press reports from Port-of-Spain, Trinidad.)

SOVIETS LAUNCH NEW FISHERY RESEARCH VESSEL:

A new Soviet fishery research vessel, the Akademik Knipovich, has been launched at the Nikolayev shipyards on the Black Sea. Its research laboratory is equipped with a hydrostatic device which can put a man and a TV transmitter underwater. The vessel has an experimental cannery, low-temperature freezers, and can be air-conditioned for voyages in tropical climates. The new vessel belongs to VNIRO (Moscow), the Soviet fishery administrative organization which operates the fishery research submarine Severianka. (Moskovskaia Pravda, July 21, 1963.)

Notes: (1) These briefs were abstracted and compiled by the U. S. Bureau of Commercial Fisheries, Branch of Foreign Fisheries and Trade.

(2) See Commercial Fisheries Review, December 1963 p. 84; November 1963 p. 84; September 1963 p. 97; August 1963 p. 112.



U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 699

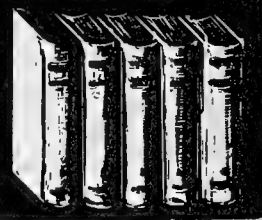
"LOST" PART OF CROMWELL CURRENT FOUND

A scientist at the Scripps Institution of Oceanography has discovered the "lost" eastern portion of the Cromwell Current in the Pacific Ocean. He found that the current veers north of the Galapagos Islands, becoming weaker and much deeper, and then returns to the equator further east.

Discovered only in 1951, the Cromwell Current differs from all other ocean currents--for example, the Gulf Stream--in that it consists of water no different in temperature or biological content from that on either side. It is a large, shallow stream flowing east beneath the equator from the western Pacific to the Galapagos Islands. There--until the discovery of the missing part--the current previously seemed to vanish. (Sea Secrets, April 1963.)



FEDERAL ACTIONS



Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

STUDY OF IMPACT OF NEW ALASKA FERRY SYSTEM AUTHORIZED:

A \$49,000 technical assistance study of the economic impact of the new Alaska Ferry System on the economy of southeastern Alaska has been approved by the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce. The study will take approximately one year. Traffic carried by the ferry system, inaugurated in January 1963, has already equaled previous forecasts of traffic projected through 1966. The study will cover the ferry's first year of operation and will identify new industries that could be established or expanded as a result of the ferry system to aid in creating all-season employment for the area's labor forces.

BUREAU OF THE CENSUS

SURVEY OF DISTRIBUTORS STOCKS OF CANNED FOODS:

Notice of consideration having appeared in the Federal Register of October 31, 1963, the final notice of determination was published in the Federal Register of December 4, 1963, as follows:

In conformity with the Act of Congress approved August 31, 1954, 13 U.S.C. 181, 224, and 225, and due Notice of Consideration having been published October 31, 1963 (28 F.R. 11647), pursuant to said act, I have determined that year-end data on stocks of 29 canned and bottled products, including vegetables, fruits, juices, and fish, are needed to aid the efficient performance of essential governmental functions, and have significant application to the needs of the public and industry and are not publicly available from nongovernmental or other governmental sources. This is a continuation of the survey conducted in previous years.

All respondents will be required to submit information covering their December 31, 1963 inventories of 29 canned and bottled vegetables, fruits, juices, and fish. Reports will not be required from all firms but will be limited to a scientifically selected sample of wholesalers

and retail multiunit organizations handling canned foods, in order to provide year-end inventories of the specified canned food items with measured reliability. These stocks will be measured in terms of actual cases with separate data requested for "all sizes smaller than No. 10" and for "sizes No. 10 or larger". In addition, a number of selected multiunit firms will be requested to provide information on the location of establishments maintaining canned food stocks that are not currently reporting in the Canned Food Survey.

Report forms will be furnished to firms covered by the survey. Additional copies of the forms are available on request to the Director, Bureau of the Census, Washington 25, D.C.

Reports are due 8 days after receipt of the report forms.

I have therefore directed that this annual survey be conducted for the purpose of collecting these data.

RICHARD M. SCAMMON,
Director,
Bureau of the Census.



Department of Health, Education, and Welfare

PUBLIC HEALTH SERVICE

STUDY OF FISH KILLS IN LOUISIANA:

The U. S. Public Health Service announced on December 4, 1963, that it was sending a team of two nationally-known aquatic biologists to help the State of Louisiana find out what has been causing fish deaths in the lower Mississippi River and the Gulf Coast.

The Chief of Louisiana's Division of Water Pollution Control had requested assistance from the Public Health Service after receiving reports that the fish may be dying as far upstream as St. Louis, Mo.

In his request for assistance, the Louisiana official said that he asked the Public Health Service to cooperate with the State as

a preventative measure to find the causes of the fish dying.

In response to this request, the Public Health Service is sending a fishery toxicologist and a microbiologist, both of the Robert A. Taft Sanitary Engineering Center in Cincinnati, to help the State.

The two Federal biologists reported to the State's water pollution laboratory in Baton Rouge on December 3, 1963. With headquarters there, the two scientists will work with the State team in the affected area.

Fish deaths similar to those now occurring have been reported from time to time since the winter of 1960. Louisiana has been investigating the cause of these deaths with help from other State and Federal agencies ever since the deaths were first reported.

The Public Health Service will take samples further upstream from the river waters and river bottoms for comparison purposes with samples already taken in the lower Mississippi. The States of Missouri and Illinois have been asked to send samples to the Public Health Service's Sanitary Engineering Center where these samples and those collected from the Service's National Water Quality Network will be examined carefully for clues to help solve the riddle of what is causing the fish deaths. (U. S. Public Health Service, press release, December 4, 1963.)



Department of the Interior

INTERNATIONAL REGULATORY AGENCIES
(FISHING AND WHALING)

NORTH PACIFIC HALIBUT FISHERY REGULATIONS:

Revised regulations of the International Pacific Halibut Commission approved by the United States June 8, 1963, pursuant to the Pacific Halibut Fishery Convention between the United States and Canada were issued as a revision to Part 301 of Title 50--Wildlife and Fisheries--Code of Federal Regulations and published in the Federal Register, October 23, 1963, as follows:

Chapter III—International Regulatory Agencies (Fishing and Whaling)

PART 301—PACIFIC HALIBUT FISHERIES

Regulations of the International Pacific Halibut Commission adopted pursuant to the Pacific Halibut Fishery Convention between the United States of America and Canada, signed March 2, 1953: Part 301 of Title 50 is revised to read as follows:

| | |
|--------|--|
| Sec. | |
| 301.1 | Regulatory areas. |
| 301.2 | Length of halibut fishing seasons. |
| 301.3 | Closed seasons. |
| 301.4 | Catch limits in areas 2, 3A and 8B North Triangle. |
| 301.5 | Size limits. |
| 301.6 | Licensing of vessels. |
| 301.7 | Retention of halibut taken under permit. |
| 301.8 | Conditions limited validity of permits. |
| 301.9 | Statistical return by vessels. |
| 301.10 | Statistical return by dealers. |
| 301.11 | Dory gear prohibited. |
| 301.12 | Retention of halibut taken by nets. |
| 301.13 | Retention of tagged halibut. |
| 301.14 | Responsibility of master. |
| 301.15 | Supervision of unloading and weighing. |
| 301.16 | Sealing of fishing equipment. |
| 301.17 | Previous regulations superseded. |

AUTHORITY: §§ 301.1 to 301.17 issued under Art. III, 50 Stat., Part II, 1353.

§ 301.1 Regulatory areas.

(a) The "convention waters" which include the territorial waters and the high seas off the western coasts of Canada and the United States of America including the southern and the western coasts of Alaska shall be divided into the following areas, all directions given being magnetic unless otherwise stated.

(b) Area 1 (south of Willapa Bay) shall include all convention waters southeast of a line running northeast and southwest through Willapa Bay Light on Cape Shoalwater, as shown on Chart 6185, published in November 1947, by the United States Coast and Geodetic Survey, which light is approximately latitude 46°43'17" N., longitude 124°04'15" W.

(c) Area 2 (Willapa Bay to Cape Spencer) shall include all convention waters off the coasts of the United States of America and of Alaska and of Canada between Area 1 and a line running through the most westerly point of Glacier Bay, Alaska, to Cape Spencer Light as shown on Chart 8304, published in June 1940, by the United States Coast and Geodetic Survey, which light is approximately latitude 58°11'57" N., longitude 136°38'18" W.; thence south one-quarter east.

(d) Area 3A (Cape Spencer to Shumagin Islands) shall include all the convention waters off the coast of Alaska that are between Area 2 and a straight line running southeast one-half east from the highest point on Kupreanof Point, which highest point is approximately latitude 55°34'08" N., longitude 159°36'00" W.; the highest point on Kupreanof Point shall be determined from Chart 8859 as published May 1954 (2d Edition) by the United States Coast and Geodetic Survey.

(e) Area 3B South (Shumagin Islands to Cape Wrangell, Attu Island, not including Bering Sea) shall include all convention waters off the coast of Alaska that are between Area 3A and a straight line running west northwest from Cape Wrangell, the westernmost extremity of Attu Island at a point approximately latitude 52°55'20" N., longitude 172°26'50" E., and that are south of straight lines running from Cape Kabuch Light at the head of Ikatan Bay, which light is approximately latitude 54°49'00" N., longitude 163°21'36" W.; thence to Cape Sarichef Light at the western end of Unimak Island, which light is approximately latitude 54°36'00" N., longitude 164°55'42" W.; thence to the head of Pumicestone Bay on Unalaska Island at a point approximately latitude 53°31'50" N., longitude 166°58'20" W.; thence to Ananiuliak Island Light on the southwest side of Unimak Island, which light is approximately latitude 52°59'48" N., longitude 168°55'06" W.; thence to Segum Island Light, which light is approximately latitude 52°23'12" N., longitude 172°26'12" W.; thence to Cape Amagalik on Tanaga Island, which cape is approximately latitude 51°40'40" N., longitude 178°07'00" W.; thence to Aleut Point at the northwest end of Amchitka Island, which point is approximately latitude 51°38'20" N., longitude 178°37'15" E.; thence to Cape Wrangell. The positions of Cape Kabuch Light and Cape Sarichef Light were determined from Chart 8860 published in March 1958 (13th Edition), revised August 1961; the position of the head of Pumicestone Bay and Ananiuliak Island Light were determined from Chart 8861, published in May 1942 (1st Edition), revised August 1961; the position of Segum Island Light was determined from Chart 8862, published in June 1960 (3rd Edition); the position of Cape Amagalik was determined from Chart 8863, published in May 1959 (6th Edition); the position of Aleut Point was determined from Chart 8864, published in June 1962 (6th Edition); and the position of Cape Wrangell was determined from Chart 8865, published 1944 (1st Edition), revised August 1952, all charts as published by the United States Coast and Geodetic Survey.

(f) Area 3B North (Bering Sea exclusive of Area 3B North Triangle) shall include all convention waters which are not included in Areas 1, 2, 3A, 3B South and 3B North Triangle.

(g) Area 3B North Triangle (in Bering Sea) shall include all the convention waters within the following boundary as stated in terms of the magnetic compass, unless otherwise indicated; from Cape Sarichef Light at the western end of Unimak Island, which light is approximately latitude 54°36'00" N., longitude 164°55'42" W., west along the boundary line of Area 3B South, as described in paragraph (e) of this section, to the point of intersection with the meridian of 170° west at a point approximately latitude 52°48'00" N.; thence true north to a point northeast of St. Paul Island, approximately latitude 57°15'00" N., longitude 170°00'00" W.; thence to the point of origin at Cape Sarichef Light. The position of Cape Sarichef was determined from Chart 8860 published in March 1958 (13th Edition), revised August 1961. The position of the point northeast of

St. Paul Island was determined from Chart 8995, published June 1954 (5th Edition), all charts as published by the United States Coast and Geodetic Survey.

§ 301.2 Length of halibut fishing seasons.

(a) In Area 1, the halibut fishing season shall commence and terminate at the same time as the halibut fishing season in Area 2 shall commence and terminate.

(b) In Area 2, the halibut fishing season shall commence at 6:00 p.m. on the 9th day of May and terminate at 6:00 p.m. on a date to be determined and announced under paragraph (b) of § 301.4.

(c) In Area 3A, the halibut fishing season shall commence at 6:00 p.m. on the 9th day of May and terminate at 6:00 p.m. on a date to be determined and announced under paragraph (b) of § 301.4.

(d) In Area 3B South, the halibut fishing season shall commence at 6:00 p.m. of the 19th day of April and terminate at 6:00 p.m. of the 15th day of October.

(e) In Area 3B North, the halibut fishing season shall commence at 6:00 p.m. of the 25th day of March and terminate at 6:00 p.m. of the 15th day of October.

(f) In Area 3B North Triangle, the halibut fishing season shall commence at 6:00 p.m. of the 25th day of March and terminate at 6:00 p.m. on a date to be determined and announced under paragraph (b) of § 301.4, or at 6:00 p.m. of the 15th day of October, whichever is earlier.

(g) All hours of opening and closing of areas in this section and other sections of the regulations of this part shall be Pacific Standard Time, except in Area 3B North and in Area 3B North Triangle where they shall be local standard time.

§ 301.3 Closed seasons.

(a) Under paragraph 1 of Article I of the Convention, all convention waters shall be closed to halibut fishing except as provided in § 301.2.

(b) All convention waters, if not already closed under other provisions of the regulations of this part, shall be closed to halibut fishing at 6:00 p.m. of the 30th day of November and shall remain closed until reopened as provided in § 301.2, and the retention and landing of any halibut caught during this closed period shall be prohibited.

(c) Nothing contained in these regulations shall prohibit the fishing for species of fish other than halibut during the closed halibut seasons, provided that it shall be unlawful for a vessel to have halibut aboard, or for any person to have halibut in his possession while so engaged except as provided for in § 301.7. Nor shall anything in these regulations prohibit the International Pacific Halibut Commission, hereafter in the regulations of this part referred to as "the Commission", from conducting or authorizing fishing operations for investigation purposes as provided for in paragraph 3 of Article I of the Convention.

§ 301.4 Catch limits in Areas 2, 3A and 3B North Triangle.

(a) The quantities of halibut to be taken during the halibut fishing seasons

in areas with catch limits shall be limited to 28,000,000 pounds in Area 2, to 34,000,000 pounds in Area 3A, and to 11,000,000 pounds in Area 3B North Triangle, each of the above quantities to consist of salable halibut and the weights in each limit to be computed as with heads off and entrails removed.

(b) The Commission shall as early in the said year as is practicable determine and announce the date on which it deems each limit of catch defined in paragraph (a) of this section will be attained, and the limit of each such catch shall then be that which shall be taken prior to said date, and fishing for halibut in the area to which each limit applies shall at that date be prohibited until each area is reopened to halibut fishing as provided in § 301.2, and provided that if it shall at any time become evident to the Commission that the limit will not be reached by such date, it may substitute another date.

(c) Catch limits shall apply only to the halibut fishing season in Area 2 and to the halibut fishing season in Area 3A and to the halibut fishing season in Area 3B North Triangle.

§ 301.5 Size limits.

The catch of halibut to be taken from all areas shall be limited to halibut which with head on are 26 inches or more in length as measured from the tip of the lower jaw to the extreme end of the middle of the tail or to halibut which with the head off and entrails removed are 5 pounds or more in weight, and the possession of any halibut of less than the above length, or the above weight, according to whether the head is on or off, by any vessel or by any master or operator of any vessel or by any person, firm or corporation, is prohibited.

§ 301.6 Licensing of vessels.

(a) All vessels of any tonnage which shall fish for halibut in any manner or hold halibut in possession in any area, or which shall transport halibut otherwise than as a common carrier documented by the Government of the United States or of Canada for the carriage of freight, must be licensed by the Commission, provided that vessels of less than five net tons or vessels which do not use set lines need not be licensed unless they shall require a permit as provided in § 301.7.

(b) Each vessel licensed by the Commission shall carry on board at all times while at sea the halibut license thus secured whether it is validated for halibut fishing or endorsed with a permit as provided in § 301.8, and this license shall at all times be subject to inspection by authorized officers of the Governments of Canada or the United States or by representatives of the Commission.

(c) The halibut license shall be issued without fee by the customs officers of the Governments of Canada or the United States or by representatives of the Commission or by fishery officers of the Governments of Canada or the United States at places where there are neither customs officers nor representatives of the Commission. A new license may be issued by the officer accepting statistical return at any time to vessels which have furnished proof of loss of the license form previously issued, or when there shall be no further space for record thereon, providing the receipt of statistical

return shall be shown on the new form for any halibut or other species taken during or after the voyage upon which loss occurred.

(d) The halibut license of any vessel shall be validated before departure from port for each halibut fishing operation for which statistical return is required and at such times as required by other provisions of the regulations in this part. This validation of a license shall be by customs officers or by fishery officers of the Governments of Canada or the United States when available at places where there are no customs officers and shall not be made unless the area in which the vessel will fish is entered on the license form and unless the provisions of § 301.9 have been complied with for all landings and all fishing operations since issue of the license, provided that if the master or operator of any vessel shall fail to comply with the provisions of § 301.9, the halibut license of such vessel may be validated by customs officers or by fishery officers upon evidence either that there has been a judicial determination of the offense or that the laws prescribing penalties therefor have been complied with, or that the said master or operator is no longer responsible for, nor sharing in, the operations of said vessel.

(e) The halibut license of any vessel fishing for halibut in Area 3B South when Area 3A is closed to halibut fishing must be validated at Sand Point, Alaska prior to such fishing, except as provided in paragraph (f) of this section.

(f) Any vessel already fishing in Area 3B South prior to the date of closure of Area 3A may continue to fish in said area until first entry at a port or place with a validating officer or until any halibut is unloaded. The vessel must comply with paragraph (g) of this section when it departs from Area 3B South.

(g) The halibut license of any vessel departing from Area 3B South into Area 3A with any halibut on board when Area 3A is closed to halibut fishing, must be validated at Sand Point, Alaska subsequent to fishing and prior to such departure.

(h) The halibut license of any vessel fishing for halibut in Area 3B North or in Area 3B North Triangle must be validated at Sand Point, Alaska, both prior to such fishing and prior to unloading any halibut at any port or place other than Sand Point, Alaska.

(i) A halibut license shall not be validated for departure for halibut fishing in Areas 1 or 2 more than 48 hours prior to the commencement of any halibut fishing season in said areas.

(j) A halibut license shall not be validated for departure for halibut fishing in Areas 3A or 3B South or 3B North or 3B North Triangle from any port or place inside said areas more than 48 hours prior to the commencement of the halibut fishing season in each of said areas, except that a halibut license validated for fishing in Area 3B North or in Area 3B North Triangle prior to the opening of Area 3B South may at the same time be validated for halibut fishing in Area 3B South when the latter area is opened; nor shall a halibut license be validated for departure for halibut fishing in Area 3A from any port or place outside said area more than 5 days prior to commencement of the halibut fishing season in said area.

(k) A halibut license shall not be valid for halibut fishing in more than one of Areas 1, 2 or 3A, as defined in § 301.1, during any one trip nor shall it be revalidated for halibut fishing in another of said areas while the vessel has any halibut on board.

(l) A halibut license may be validated for halibut fishing in Areas 3A and 3B South except that when Area 3A is closed such validation shall be subject to the conditions contained in paragraphs (e), (f) and (g) of this section and to any other applicable provisions of these regulations.

(m) A halibut license may be validated for halibut fishing in more than one of Areas 3B South, 3B North or 3B North Triangle provided that when Area 3B North Triangle is open to halibut fishing the master or operator of the vessel shall declare in which one of the three said areas the vessel intends to fish for halibut, and provided the master or operator shall report by radio to any authorized officer at Sand Point, Alaska the intention of the vessel to shift its fishing activities to another of said areas, the date and approximate time of the shift and the amount of halibut caught in Area 3B North Triangle that is on board at the time of shifting, and such radio report shall be recorded at the time in the log book of the vessel.

(n) A halibut license shall not be valid for halibut fishing in any area closed to halibut fishing nor for the possession of halibut in any area closed to halibut fishing except while in actual transit to an area open to halibut fishing, or to or within a port of sale and as provided in paragraph (q) of this section. The said license shall become invalid for the possession of halibut if the licensed vessel is fishing or attempting to fish for any species of fish in any area closed to halibut fishing, or if the vessel has not complied with the provisions of § 301.16, if applicable.

(o) Any vessel which is not required to be licensed for halibut fishing under paragraph (a) of this section shall not possess any halibut of any origin in any area closed to halibut fishing except while in actual transit to or within a port of sale.

(p) A halibut license shall not be valid for halibut fishing in any area while a permit endorsed thereon is in effect, nor shall it be validated for halibut fishing while halibut taken under such permit is on board.

(q) A halibut license when validated for halibut fishing in Area 3A shall not be valid for the possession of any halibut in Area 2 if said vessel is in possession of baited gear more than 25 miles from Cape Spencer Light, Alaska; and a halibut license when validated for halibut fishing in Area 3B South or in Area 3B North or in Area 3B North Triangle shall not be valid for the possession of any halibut in Area 3A, when Area 3A is closed to halibut fishing, if said vessel is in possession of baited gear more than 20 miles by navigable water route from the boundary between Areas 3A and 3B South.

(r) No person on any vessel which is required to have a halibut license under paragraph (a) of this section shall fish for halibut or have halibut in his possession, unless said vessel has a valid license issued and in force in conformity with the provisions of this section.

§ 301.7 Retention of halibut taken under permit.

(a) There may be retained for sale on any vessel which shall have a permit as provided in § 301.8 such halibut as is caught incidentally to fishing by that vessel in any area except in Area 3B North Triangle after it has been closed to halibut fishing under § 301.2 or § 301.4 with set lines (of the type commonly used in the Pacific Coast halibut fishery) for other species, not to exceed at any time one pound of halibut for each seven pounds of salable fish, actually utilized, of other species not including salmon or tuna; and such halibut may be sold as the catch of said vessel, the weight of all fish to be computed as with heads off and entrails removed, provided that it shall not be a violation of this regulation for any such vessel to have in possession except in Area 3B North halibut in addition to the amount herein allowed to be sold if such additional halibut shall not exceed thirty percent of such amount and shall be forfeited and surrendered at the time of landing as provided in paragraph (d) of this section.

(b) Halibut retained under such permit shall not be filleted, flitched, steaked or butchered beyond the removal of the head and entrails while on the catching vessel.

(c) Halibut retained under such permit shall not be landed or otherwise removed or be received by any person, firm or corporation from the catching vessel until all halibut on board shall have been reported to a customs, fishery or other authorized enforcement officer of the Governments of Canada or the United States by the master or operator of said vessel and also by the person, firm or corporation receiving the halibut, and no halibut or other fish shall be landed or removed or be received from the catching vessel, except with the permission of said officer and under such supervision as the said officer may deem advisable.

(d) Halibut retained under such permit shall not be purchased or held in possession by any person other than the master, operator or crew of the catching vessel in excess of the proportion allowed in paragraph (a) of this section until such excess, whatever its origin, shall have been forfeited and surrendered to the customs, fishery or other authorized officers of the Governments of Canada or the United States. In forfeiting such excess, the vessel shall be permitted to surrender any part of its catch of halibut, provided that the amount retained shall not exceed the proportion herein allowed.

(e) Permits for the retention and landing of halibut caught in all convention waters in the year 1963 shall become invalid at 6:00 p.m. of the 15th day of November of said year.

§ 301.8 Conditions limiting validity of permits.

(a) Any vessel which shall be used in fishing for other species than halibut in any area except in Area 3B North Triangle after it has been closed to halibut fishing under § 301.2 or § 301.4 must have a halibut license and a permit if it shall retain, land or sell any halibut caught incidentally to such fishing or possess any halibut of any origin during such fishing, as provided in § 301.7.

(b) The permit shall be shown by endorsement of the issuing officer on the face of the halibut license form held by said vessel and shall show the area or areas for which the permit is issued.

(c) The permit shall terminate at the time of the first landing thereafter of fish of any species and a new permit shall be secured before any subsequent fishing operation for which a permit is required.

(d) A permit shall not be issued to any vessel which shall have halibut on board taken while said vessel was licensed to fish halibut in an open area unless such halibut shall be considered as taken under the issued permit and shall thereby be subject to forfeiture when landed if in excess of the proportion permitted in paragraph (a) of § 301.7.

(e) A permit shall not be issued to, or be valid if held by, any vessel which shall fish with other than set lines of the type commonly used in the Pacific Coast halibut fishery.

(f) The permit of any vessel shall not be valid unless the permit is granted before departure from port for each fishing operation for which statistical returns are required. This granting of a permit shall be by customs officers or by fishery officers of the Governments of Canada or the United States when available at places where there are no customs officers and shall not be made unless the area or areas in which the vessel will fish is entered on the halibut license form and unless the provisions of § 301.9 have been complied with for all landings and all fishing operations since issue of the license or permit, provided that if the master or operator of any vessel shall fail to comply with the provisions of § 301.9 of these regulations the permit of such vessel may be granted by customs or fishery officers upon evidence either that there has been a judicial determination of the offense or that the laws prescribing penalties therefor have been complied with, or that the said master or operator is no longer responsible for, nor sharing in, the operations of said vessel.

(g) The permit of any vessel shall not be valid if said vessel shall have in its possession at any time halibut in excess of the amount allowed under paragraph (a) of § 301.7.

(h) No person shall retain, land or sell any halibut caught incidentally to fishing for other species in any area closed to halibut fishing under § 301.2 or § 301.4, or shall have halibut of any origin in his possession during such fishing, unless such person is a member of the crew of and is upon a vessel with a halibut license and with a valid permit issued and in force in conformity with the provisions of §§ 301.7 and 301.8.

§ 301.9 Statistical return by vessels.

(a) Statistical return as to the amount of halibut taken during fishing operations must be made by the master or operator of any vessel licensed under the regulations of this part and as to the amount of halibut and other species by the master or operator of any vessel operating under permit as provided for in §§ 301.7 and 301.8, within 96 hours of landing, sale or transfer of halibut or of first entry thereafter into a port where there is an officer authorized to receive such return.

(b) The statistical return must state the port of landing and the amount of each species taken within the area or areas defined in the regulations in this part, for which the vessel's license is validated for halibut fishing or within the area or areas for which the vessel's license is endorsed as a permit.

(c) The statistical return must include all halibut landed or transferred to other vessels and all halibut held in possession on board and must be full, true and correct in all respects herein required.

(d) The master or operator or any person engaged on shares in the operation of any vessel licensed or holding a permit under the regulations of this part may be required by the Commission or by any officer of the Governments of Canada or the United States authorized to receive such return to certify to its correctness to the best of his information and belief and to support the certificate by a sworn statement. Validation of a halibut license or issuance of a permit after such sworn return is made shall be provisional and shall not render the license or permit valid in case the return shall later be shown to be false or fraudulently made.

(e) The master or operator of any vessel holding a license or permit under the regulations in this part shall keep an accurate log of all fishing operations including therein date, locality, amount of gear used, and amount of halibut taken daily in each such locality. This log record shall be retained for a period of two years and shall be open to inspection by representatives of the Commission authorized for this purpose.

(f) The master, operator or any other person engaged on shares in the operation of any vessel licensed under these regulations may be required by the Commission or by any officer of the Governments of Canada or the United States to certify to the correctness of such log record to the best of his information and belief and to support the certificate by a sworn statement.

(g) The master or operator of any vessel holding a license validated for fishing in Area 3B North or in Area 3B North Triangle on entering Sand Point, Alaska enroute to another port to unload, must report to an authorized representative of the United States or of the Commission the estimated amount of halibut on board that was caught in each regulatory area.

§ 301.10 Statistical return by dealers.

(a) All persons, firms or corporations that shall buy halibut or receive halibut for any purpose from fishing or transporting vessels or other carrier shall keep and on request furnish to customs officers or to any enforcing officer of the Governments of Canada or the United States or to representatives of the Commission, records of each purchase or receipt of halibut, showing date, locality, name of vessel, person, firm or corporation purchased or received from and the amount in pounds according to trade categories of the halibut and other species landed with the halibut.

(b) All persons, firms or corporations receiving fish from a vessel fishing under permit as provided in § 301.7 shall within 48 hours make to an authorized enforcement officer of the Governments of Canada or the United States a signed statistical return showing the date, locality,

name of vessel received from and the amount of halibut and of other species landed with the halibut and certifying that permission to receive such fish was secured in accordance with paragraph (c) of § 301.7. Such persons, firms or corporations may be required by any officer of the Governments of Canada or the United States to support the accuracy of the above signed statistical return with a sworn statement.

(c) All records of all persons, firms or corporations concerning the landing, purchase, receipt and sale of halibut and other species landed therewith shall be retained for a period of two years and shall be open at all times to inspection by any enforcement officer of the Governments of Canada or the United States or by any authorized representative of the Commission. Such persons, firms or corporations may be required to certify to the correctness of such records and to support the certificate by a sworn statement.

(d) The possession by any person, firm or corporation of halibut which such person, firm or corporation knows to have been taken by a vessel without a valid halibut license or a vessel without a permit when such license or permit is required, is prohibited.

(e) No person, firm or corporation shall unload any halibut from any vessel that has fished for halibut in Area 3B South or in Area 3B North or in Area 3B North Triangle after the closure of Area 3A unless the license of said vessel has been validated at Sand Point, Alaska as required in paragraphs (e) and (g) of § 301.6, and unless the vessel has complied with the provisions of § 301.16, or unless permission to unload such halibut has been secured from an enforcement officer of the Governments of Canada or the United States.

§ 301.11 Dory gear prohibited.

The use of any hand gurdy or other appliance in hauling halibut gear by hand power in any dory or small boat operated from a vessel licensed under the provisions of these regulations is prohibited in all convention waters.

§ 301.12 Retention of halibut taken by nets.

(a) It is prohibited to retain halibut taken with a net of any kind or to have in possession any halibut while fishing with any net or nets other than bait nets in any convention waters except in those waters of Area 3B North that are west of the meridian of 175° W. longitude and north of a line running from Cape Newenham, which cape is approximately latitude 58°39'00" N., longitude 162°10'25" W. to a point northeast of St. Paul Island, approximately latitude 57°15'00" N., longitude 170°00'00" W.; thence to a point of intersection with the meridian of 175° W. longitude at approximately 58°38'00" N. latitude. The position of Cape Newenham was determined from Chart 9103 published September 29, 1958 (3d Edition), revised April 30, 1962 by the United States Coast and Geodetic Survey.

(b) All vessels with any halibut on board except those fishing in or in transit to or in transit from the waters of Area 3B North described in paragraph (a) of this section are prohibited to use or possess any net or nets other than bait nets.

(c) The character and the use of bait nets referred to in paragraphs (a) and

(b) of this section shall conform to the laws and regulations of the country where they may be utilized and shall be of a type commonly used for such purposes and said bait nets shall be utilized for no other purpose than the capture of bait for use of the vessel carrying them.

§ 301.13 Retention of tagged halibut.

Nothing contained in the regulations in this part shall prohibit any vessel at any time from retaining and landing any halibut which bears a Commission tag at the time of capture, provided that such halibut with the tag still attached is reported at the time of landing to representatives of the Commission or to enforcement officers of the Governments of Canada or the United States and is made available to them for examination.

§ 301.14 Responsibility of master.

Wherever in the regulations of this part any duty is laid upon any vessel, it shall be the personal responsibility of the master or operator of said vessel to see that said duty is performed and he shall personally be responsible for the performance of said duty. This provision shall not be construed to relieve any member of the crew of any responsibility with which he would otherwise be chargeable.

§ 301.15 Supervision of unloading and weighing.

The unloading and weighing of the halibut of any vessel licensed under the regulations in this part and the unloading and weighing of halibut and other species of any vessel holding a permit under the regulations in this part shall be under such supervision as the customs or other authorized officer may deem advisable in order to assure the fulfillment of the provisions of the regulations in this part.

§ 301.16 Sealing of fishing equipment.

Any fishing vessel, prior to departing from Area 3B South into Area 3A with any halibut on board when Area 3A, as defined in § 301.1, is closed to halibut fishing, shall be equipped with approved attachments on the chute to permit the securing of a seal or seals, and prior to such departure shall request that said chute or the gurdy used for hauling gear or both chute and gurdy be sealed with such seal or seals as shall be required by any customs or fishery officer or any other duly authorized officer of the Government of the United States. The vessel shall keep such seal or seals intact until removed by a customs or fishery officer of the United States or of Canada and shall not unload any halibut until

such time as said officer removes the seal or seals and grants permission to unload.

§ 301.17 Previous regulations superseded.

The regulations in this part shall supersede all previous regulations adopted pursuant to the Convention between Canada and the United States of America for the preservation of the halibut fishery of the Northern Pacific Ocean and Bering Sea, signed March 2, 1953, except as to offenses occurring prior to the approval of these regulations. The regulations in this part shall be effective as to each succeeding year, with the dates herein specified changed accordingly, until superseded by subsequently approved regulations. Any determination made by the Commission pursuant to these regulations shall become effective immediately.

WM. M. SPRULES,
Chairman.
H. A. DUNLOP,
Secretary.
HAROLD E. CROWTHER,
Vice Chairman.
WILLIAM A. BATES.
HAROLD S. HELLAND.
MATTIAS MADSEN.
RICHARD NELSON.

Approved: June 8, 1963.

JOHN F. KENNEDY.



United States Circuit Court of Appeals

FISHERMEN CONSIDERED EMPLOYEES FOR TAX PURPOSES:

The First Circuit Court of Appeals on December 6, 1963, upheld a ruling that fishing vessel crews and captains who operate under the "share" system are considered employees for Federal tax purposes. The ruling had been handed down April 9, 1963, by a Judge of the United States District Court in Portland, Maine. Two New England vessel owners had filed suit to recover a substantial amount of money paid out in Social Security and unemployment taxes over a period of three years. The owners claimed that they should not have had to pay the taxes on fishing vessel payrolls because the crewmen were not considered employees, but were independent contractors. The United States District Court Judge ruled that "the relationship which the parties (vessel owners and fishermen) intended to, and did in fact, establish, was an employment relationship within the meaning of the applicable statutes." The ruling however, applies only to those who are required by law to participate in tax programs

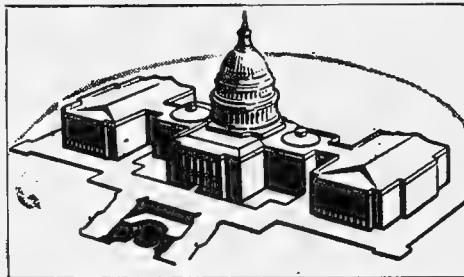
of the Federal Insurance Contributions Act and Federal Unemployment Tax Act.

Note: See Commercial Fisheries Review, July 1963 p. 107.



Eighty-Eighth Congress (First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and



allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

CONSERVATION OF MARINE FISHERIES RESOURCES: On Nov. 22, 1963, Senator Bartlett inserted in the Congressional Record (page 21571) an address by Senator Gruening titled "Our Fisheries Need Greater and Firmer Support and a 12-Mile Limit," delivered to the 16th annual session of the Gulf and Caribbean Fisheries Institute held in Miami, Fla., Nov. 11, 1963.

FISHERMEN'S FINANCIAL AID FOR ECONOMIC DISLOCATION: H. R. 9408 (Blatnik) introduced in House Dec. 10, 1963, and S. 2411 (McCarthy et. al) introduced in Senate, Dec. 20, 1963, to authorize the Secretary of the Interior to make payments to reestablish the purchasing power of American fishermen suffering temporary economic dislocation; referred to House Committee on Merchant Marine and Fisheries and the Senate Committee on Commerce, respectively.

FISHING INDUSTRY CLAIMS AGAINST THE U. S.: H. R. 9298 (O'Konski) introduced in House Nov. 29, 1963, to confer jurisdiction in the U. S. district courts to hear, determine, and render judgment on the claims of certain commercial fishermen and fish processors against the United States; referred to the Committee on the Judiciary. The bill would confer jurisdiction on the Federal District Courts to litigate "claims of persons engaged in commercial fishing activities on the Great Lakes or in the processing for commercial sale of fish caught in the Great Lakes against the United States for damages to their business resulting from the news release concerning smoked fish issued by the Food and Drug Administration of the Department of Health, Education, and Welfare on October 25, 1963."

FOOD-FOR-PEACE, AND FISH: The President on Dec. 16, 1963, signed H. R. 7885, to amend further the Foreign Assistance Act of 1961, as amended, and for other purposes (P. L. 88-205). Included in this law is a provision for the inclusion of domestically produced fishery products under P. L. 480 (Sec. 403 (c)). This would amend section 106 of the Agricultural Trade Development and Assistance Act of 1954 (P. L. 480) to include in title I and title IV programs any domestically produced fishery product if the Secretary of the Interior determines that the product at the time of export is excess of domestic requirements, adequate carry-over, and anticipated exports for dollars. Fish flour will not be included until approved by the Food and Drug Administration. The amendment with respect to title I will not become effective until Jan. 1, 1965.

FOOD AND FIBER COMMISSION: S. J. Res. 134 (Humphrey), providing for the appointment of a bipartisan Commission to make a detailed study of food and fiber needs, introduced in Senate Nov. 20, 1963; referred to Committee on Agriculture and Forestry.

FOREIGN ASSISTANCE ACT OF 1961 AMENDMENT: On Nov. 21, 1963, conferees met in executive session to resolve the differences between the Senate- and House-passed versions of H. R. 7885, authorizing funds to continue the foreign assistance program for fiscal year 1964, but did not reach final agreement.

IMPORT COMMODITY LABELING: The Senate on Dec. 16, 1963, and the House on Dec. 18, 1963, adopted the conference report (H. Rept. 1035) on H. R. 2513, to amend the Tariff Act of 1930 to require certain new packages of imported articles to be marked to indicate the country of origin, thus clearing the bill for the President's signature.

INDIAN FISHING RIGHTS: H. J. Res. 805 (Stinson) introduced in House Nov. 19, 1963. Provides that: "in accordance with and in furtherance of the purposes of any treaty with American Indians that secures to them a right to take fish at all usual and accustomed places in common with other citizens, the States involved are authorized to enact and to enforce laws of a purely regulatory nature concerning the time and manner of fishing outside an Indian reservation that are reasonably necessary for the conservation of fish, and that are equally applicable to Indians and all other citizens without this distinction. State legislation enacted pursuant to this law is hereby declared to be in furtherance of and not in derogation of the treaties involved;" referred to the Committee on Interior and Insular Affairs.

INTERNATIONAL NORTH PACIFIC FISHERIES PROBLEMS: On November 20, 1963, Senator Magnuson inserted in the Congressional Record an article from a fisheries periodical commenting on the presence in July 1963 of a Soviet fishing vessel off the coast of Washington State (Appendix page A7186). The Senator also inserted a newspaper article titled, "International Fisheries: The Problems are Complex" (Appendix pages A7207-7208).

NORTH PACIFIC FUR SEAL CONVENTION: Protocol amending the interim Convention on Conservation of North Pacific Fur Seals, signed at Washington, October 8, 1963, on behalf of Canada, Japan, the U. S. S. R., and United States (Ex. O, 88th Congress, 1st Session). Received in the Senate on December 2, 1963, and referred to the Committee on Foreign Relations.

OCEANOGRAPHY WORLD CONFERENCE: H. J. Res. 877 (Fascell) introduced in House Dec. 17, 1963, providing for a world conference on oceanography to be convened in the United States in 1965; referred to Committee on Foreign Affairs. Representative Fascell on Dec. 18, 1963, extended his remarks in support of this resolution.

PRICE-QUALITY STABILIZATION: A special Subcommittee of the Senate Committee on Commerce continued hearings on S. 774, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution, and to confirm, define and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes. Hearings recessed subject to call.

SCIENCE AND TECHNOLOGY OFFICE FOR CONGRESS: On Nov. 21, 1963, Congressman Sibal spoke from the floor of the House on the background of H. R. 6866 which he stated was "designed to equip the legislative branch with tools it needs to meet the challenge of the new science. This bill would provide Congress with independent continuing advisory staffs of scientists and technologists." Congressman Sibal pointed out that public hearings on H. R. 6866 would be held Dec. 4, 1963, before the Subcommittee on Accounts of the House Administration Committee. (Congressional Record, page 21542.)

Speaking on the floor of the Senate on Nov. 22, 1963, Senator Bartlett called attention to the public hearings on H. R. 6866 and inserted in the Congressional Record (page 21569) an article from a periodical discussing the proposals to establish a Congressional Office of Science and Technology.

Rep. Widnall (New Jersey) on Dec. 17, 1963, spoke from the floor of the House in favor of H. R. 8066, to establish in the legislative branch of the Government the Congressional Office of Science and Technology. He also inserted an article from the Providence Journal of Dec. 11, 1963, concerning problems of the National Science Program.

SMALL BUSINESS DISASTER LOANS: On Nov. 21, 1963, the Senate passed S. 1309, to change the name of the Small Business Administration to the Federal Small Business Administration, and increase authorizations for loans therefor, as amended by committee amendment (in nature of a substitute), which had first been amended by adoption of Senator Hart's amendment to make eligible for disaster loans small business concerns that have suffered substantial economic injury through inability to process or market food products because of disease or poison therein occurring through natural or undetermined causes.

STATE DEPARTMENT APPROPRIATIONS FY 1964: The Senate on Dec. 12, 1963, passed with amendments H. R. 7063, making appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and related agencies for the fiscal year ending June 30, 1964, and for other purposes. Included in the appropriations for the Department of State are funds for the international fisheries commissions. The Senate insisted on its amendments, asked for a conference and appointed as conferees Senators McClellan, Ellender, Magnuson, Holland, Fulbright, Smith, Saltonstall and Mundt. The bill passed the House on June 18, 1963.

The House and the Senate on Dec. 18, 1963, adopted the conference report (H. Rept. 1056) on H. R. 7063. The bill is now cleared for signature by the President.

WATER RESOURCES COUNCIL: The Senate Committee on Interior and Insular Affairs in executive session on Nov. 22, 1963, ordered favorably reported S. 1111 (amended), to establish a Water Resources Council to assist in the development of comprehensive water resources planning.

WATER POLLUTION CONTROL ADMINISTRATION: H. R. 9363 (Flood) introduced in House Dec. 5, 1963, to amend the Federal Water Pollution Act, as amended, to establish the Federal Water Pollution Control Administration, to increase grants for construction of municipal sewage treatment works, to provide financial assistance to municipalities and others for the separation of combined sewers, to authorize the issuance of regulations to aid in preventing, controlling, and abating pollution of interstate or navigable waters; referred to Committee on Public Works. Similar or identical to other bills previously introduced in House.

WATER RESOURCES COUNCIL: The Senate on Dec. 4, 1963, passed S. 1111 (amended), to establish a Water Resources Council to assist in the development of comprehensive water resources planning.

VESSEL COLLISION LIABILITY: The Merchant Marine and Fisheries Subcommittee of the Senate Committee on Commerce, Dec. 9, 1963, in executive session, approved for full Committee consideration S. 555, to establish principals for the apportionment of liability in cases of collision between vessels (amendment in the nature of a substitute bill).



COCONUT CRAB

An interesting statement regarding the coconut crab appeared in an article titled "The Quest for the Home of the Coconut," which appeared in the July 1963 issue of the periodical South Pacific Bulletin. The reference to the crab states:

Menon and Pandalai quote Child (1953) as citing an interesting biological association between the Cocos and the coconut robber crab (Birgus latro).

"These crabs live exclusively upon the meat of the coconut. They climb the palms, and, with powerful claws, nip off a nut. Descending then, the crab tears open the fallen nut and proceeds to feast upon the kernel. The crab in turn is considered a delicacy by native people. It is a nighttime marauder, but the native hunter is wily. Knowing that the crab descends backwards from the top of the palm, he ties twisted grass high up around the stems of palms likely to house crabs. When the descending robber's soft posterior touches the grass band, it believes, apparently, that it has touched ground and lets go. Crashing to earth, the crab lies disabled until collected by the hunter.

"This animal's association with the coconut palm is of such ancient standing that an analysis of its fat reveals a strong similarity to coconut oil and very little structural resemblance to animal fat. . . ."



FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
 FL - FISHERY LEAFLETS.
 MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
 SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
 SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
 SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
 WL - WILDLIFE LEAFLETS

| Number | Title |
|----------|--|
| CFS-3279 | - Mississippi Landings, 1962 Annual Summary, 5 pp. |
| CFS-3283 | - Washington Landings, 1962 Annual Summary, 2 pp. |
| CFS-3288 | - New Jersey Landings, July 1963, 4 pp. |
| CFS-3297 | - Maine Landings, July 1963, 4 pp. |
| CFS-3298 | - Ohio Landings, June 1963, 3 pp. |
| CFS-3303 | - Virginia Landings, June 1963, 4 pp. |
| CFS-3304 | - Louisiana Landings, 1962 Annual Summary, 8 pp. |
| CFS-3305 | - Fish Meal and Oil, July 1963, 2 pp. |
| CFS-3307 | - Gulf Coast Shrimp Data, May 1963, 24 pp. |
| CFS-3308 | - Texas Landings, March 1963, 3 pp. |
| CFS-3310 | - Georgia Landings, August 1963, 3 pp. |
| CFS-3311 | - Ohio Landings, July 1963, 3 pp. |
| CFS-3312 | - Wisconsin Landings, July 1963, 2 pp. |
| CFS-3314 | - North Carolina Landings, August 1963, 4 pp. |
| CFS-3315 | - Virginia Landings, July 1963, 4 pp. |
| CFS-3317 | - South Carolina Landings, August 1963, 3 pp. |
| CFS-3319 | - Shrimp Landings, June 1963, 7 pp. |
| CFS-3321 | - Michigan Landings, June 1963, 3 pp. |
| CFS-3322 | - Rhode Island Landings, July 1963, 3 pp. |
| CFS-3323 | - Mississippi Landings, July 1963, 3 pp. |
| CFS-3324 | - New Jersey Landings, August 1963, 3 pp. |
| CFS-3326 | - Fish Meal and Oil, August 1963, 2 pp. |
| CFS-3327 | - New York Landings, August 1963, 4 pp. |
| CFS-3328 | - California Landings, July 1963, 4 pp. |
| CFS-3329 | - Gulf Coast Shrimp Data, June 1963, 24 pp. |
| CFS-3330 | - Wisconsin Landings, August 1963, 2 pp. |
| CFS-3331 | - New England Fisheries, 1962 Annual Summary, 7 pp. |
| SL-40 | - Wholesale Dealers in Fishery Products, Oklahoma, 1962, 1 p. (Revised). |

Sep. No. 695 - An Electromechanical Fishing and Counting Fence Used in Ireland.

Sep. No. 696 - Scope Ratio-Depth Relationships for Beam Trawl, Shrimp Trawl and Otter Trawl.

Sep. No. 697 - Foreign Fisheries Briefs.

FL-457 - Soft-Egg Disease of Fishes, by Ken Wolf, 2 pp., September 1962.

SSR-Fish. No. 453 - Stream Catalog of Southeastern Alaska Regulatory District No. 2, edited by Russell F. Orrell and Edward Klinkhart, 317 pp., illus., April 1963.

WL-452 - Fur Catch in the United States, 1962, 4 pp., July 1963.

Farm Reservoir Fishes, Circular No. 131, 13 pp., printed.

Trident--A Long Range Report of the Bureau of Commercial Fisheries, Circular 149, 121 pp., illus., processed, September 1963. This report has two broad objectives: (1) to strengthen the industry and (2) to conserve the resource. These objectives will be attained through a vigorous application of the detailed 3-pronged plan of research, development, and services outlined in the body of this report. The first section of this report is "Action Now," a 13-point plan to deal immediately with the urgent problems of the industry. It is in this section that solutions, strongly stressing the development and services aspect of Trident, are proposed for problems which demand attention now and which will require continuing attention as the long range plan is fully implemented. The 13-point plan proposes that: (1) the fishing industry be provided with assistance comparable to that provided by the Government generally; (2) the tariff structure for fishery products be thoroughly reexamined and that modifications be proposed for any disparities that may be found in the classification of duties; (3) methods be developed to offset subsidies paid by foreign countries to producers who export fishery products to the United States; (4) a broader and more realistic fishing vessel construction subsidy law be enacted; (5) more emphasis be placed on the development of bilateral and multilateral international agreements in the management of high seas fishery resources; (6) more meetings be held and more information exchanged

between the U. S. industry and foreign fisheries having common problems; (7) the Government increase its efforts to develop and expand foreign markets for exportable fishery products; (8) provision be made to obtain more adequate information on fishery developments and markets in key foreign areas; (9) technical findings be more quickly disseminated and that the industry be more aggressive in the adoption of new developments and findings; (10) industry-Government efforts to develop quality standards for fishery products be accelerated; (11) joint market promotional and advertising campaigns by U. S. and foreign producers be encouraged to stimulate the consumption of fishery products throughout the world; (12) concerted action be taken to stimulate the development of research scientists to meet rapidly expanding research needs; (13) aggressive safety programs be expanded to decrease alarmingly high fishing vessel hull and protection and indemnity insurance, and thus reduce operating costs. The second section of Trident, "The Long Haul," attacks, primarily through research, the basic, deep-rooted problems of the industry and of the resources. The impact of "The Long Haul" will be felt more gradually than that of the "Action Now" program, but both approaches, necessary immediate action and long-term research, are essential to achieve the Bureau's long range objectives. In the second section plans are outlined that detail the searching, time consuming efforts that eventually will fill the many gaps in knowledge of living resources of the sea and their environment. Insufficient knowledge hampers our conservation of these resources and handicaps their full utilization. New methods of finding and catching fish, as well as handling, preserving, and transporting the catch, are needed. Impairment of natural habitat by man's activities has severely injured important inshore fisheries and needs more intensive study.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, WYATT BLDG., SUITE 611, 777 14TH ST. NW., WASHINGTON, D. C. 20005.

| Number | Title |
|--------|---|
| MNL-63 | Annual Report on Egyptian Fisheries, 1962, 32 pp. |

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

Annual Report for the Fiscal Year Ending June 30, 1963, 50 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, La Jolla, Calif.) Discusses laboratory activities; programs and projects; vessel operations; and the sardine fishery--population dynamics, length studies, spawning 1962, competition between sardine and anchovies; quantitative sampling; plankton volumes; plankton constituents; and plankton behavior studies. Also covers hake fecundity--material and methods, length-fecundity, weight-fecundity, and number of spawnings; sardine subpopulations; availability of food for sardine; sardine and anchovy behavior in laboratory; general physiology--time temperature study, herring study, starfish behavior substance, and adult sardine; nutrition--protein conversion, sea urchin, filter-feeding crustaceans, and uptake of soluble organic nutrients; rearing of pelagic fish; pelagic survey for resource evaluation; construction of new laboratory; and contract for construction of new research vessel.

(Baltimore) Monthly Summary--Fishery Products, July and August 1963, 8 pp. each. (Market News Service,

U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the months indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, September 1963, 18 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, October 1963, 9 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6317, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

Fishery Industrial Research, vol. 1, no. 1, April 1962, 177 pp., illus., printed. (Branch of Reports, Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, 800 E St. NW., 2nd Floor, Washington, D. C. 20240.) This is the first issue of a new periodical which will be published irregularly and will present papers devoted to research in problems of the fishery industry. This issue contains "Economic Aspects of the Pacific Halibut Fishery," by James Crutchfield and Arnold Zellner. Under international regulation by the Canadian and United States Governments, the Pacific halibut fishery, which once faced depletion, has been restored to a high level of productivity. Although the stocks of halibut now are adequately protected, economic weaknesses in the fishery prompted this study. The report discusses the basic theory of the regulation, analyzes its economic effects, and presents the conclusions drawn from the analysis and their implications for public policy.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, September 1963, 12 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, October 1963, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and

Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production for the month indicated.

New England Fisheries--Monthly Summary, October 1963, 23 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--September 1963, 19 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks; for the month indicated.

New York City's Wholesale Fishery Trade, 1962 (Including Statistics and Marketing Trends), by T. J. Risoli, 44 pp., illus. (Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 155 John St., New York, N. Y. 10038.) The first part of this annual summary discusses fishery products receipts and marketing trends in the salt-water section of New York's wholesale Fulton Fish Market during 1962. The second part covers marketing trends and receipts in the fresh-water fish market (Peck Slip Area) for 1962. The third section contains miscellaneous trends and developments: growth of a long-line fishery for swordfish; the planned production of specialty products from fresh-water fish; and estimated per capita consumption of fishery products in the New York City area. The fourth part presents a series of statistical tables giving receipts by species, states, or provinces, and methods of transportation, 1962, with comparisons; monthly summary of prices of selected frozen fishery products; and imports of fishery products entered at New York, 1962 and 1961.

Receipts and Prices of Fresh and Frozen Fishery Products at Chicago, 1962, by C. E. Cope, 57 pp., illus., processed, August 1963. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 1014, Chicago, Ill. 60607.) In the analysis of receipts of fishery products receipts at Chicago, the author discusses the drop in 1962 fishery products receipts. He also discusses sources of receipts, progress in sea lamprey control, the marketing of breaded yellow perch, development of a new perch filleting machine, use of liquid nitrogen for quick-freezing fishery products, trawling in Lakes Erie and Michigan, Chicago imports of fishery products by St. Lawrence Seaway, and survey of canned tuna in brine by Japa-

nese. Also included is a table giving the names, classifications, and approximate weights of certain fishery products as used in the Chicago wholesale fresh-water fish market. The second section presents statistical data on fresh and frozen fishery products receipts at Chicago by species and by states and provinces of origin, states and provinces by species, species by months, states and provinces by months, totals by species, and totals by states and provinces. Receipts are tabulated by mode of transportation (truck, express, and freight). A table shows the monthly range of wholesale prices of some of the leading varieties of fresh-water fish species, frozen fillets, and other frozen fish and shellfish.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, October 1963, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

West Coast Mexican Shrimp Crossings, by Ports of Entry, 1951-1963, 7 pp., November 1963. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) Presents statistical tables showing data on monthly imports of Mexican shrimp through ports of entry of San Luis, Lukeville, Nogales, Calexico, and San Ysidro, January 1958-October 1963; and annual imports, 1951-1963.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

Fish and Wildlife, Price List 21, 15 pp., printed, April 1963 (48th Edition). Contains a list of all fish and wildlife publications available from the Government Printing Office, together with order blanks for convenience in ordering publications.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ANCHOVY:

The Influence of Available Food Resources on the Survival Potential of the Azov Anchovy, by P. I. Grudin, 4 pp., processed. (Translated from the Russian, Trudy Soveshchaniy, no. 13, 1961, pp. 454-456.) Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, Suffolk, England, 1963.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Live-Box Experiments with Anchovetas, *Cetengraulis mysticus*, in the Gulf of Panama," by William H. Bayliff and Edward F. Klima, article, *Inter-American Tropical Tuna Commission Bulletin*, vol. VI, no. 8, 1962, pp. 335-446, illus., printed in Spanish and English. Inter-American Tropical Tuna Commission, La Jolla, Calif.

La Pesca de la Anchoveta--Estatística de Pesca y Esfuerzo en Abril, Mayo y Junio de 1962 (The Anchovy Fishery--Statistics of Fishing Effort in April, May, and June 1962), Informe No. 5, printed in Spanish. Instituto de Investigaciones de los Recursos Marinos, Callao, Peru, 1962.

AQUATIC SCIENCE:

An International Service for Retrieving Aquatic Science Literature, by S. B. Salla, J. S. O'Connor, and R. A. Shappy, Fisheries Biology Technical Paper No. 28, printed. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962.

ARGENTINA:

Produccion Pesquera de la Republica Argentina, 1962 (Fishery Production in the Republic of Argentina, 1962), 127 pp., illus., printed in Spanish. Departamento de Investigaciones Pesqueras, Direccion General de Pesca y Conservacion de la Fauna, Ministerio de Agricultura y Ganaderia, Brasil y Florencio Sanchez, Buenos Aires, Argentina.

AUSTRALIA:

Fishing Industry Act, 1956; Annual Report on the Operation of the Act, 1961/62, 8 pp., printed. Ministry for Primary Industry, Canberra, Australia, 1963.

BACTERIOLOGY:

A Preliminary Note on GAFFKAEMIA Investigations in England, by P. C. Wood, Special Meeting on Crustacea No. 31, 8 pp., illus., processed. International Council for the Exploration of the Sea, Charlottenlund Slot, Denmark, 1962.

BASS:

The Kelp Bass (PARALABRAX CLATHRATUS) and Its Fishery, 1947-1958, by Parke H. Young, Fish Bulletin 122, 67 pp., illus., printed. Printing Division, Documents Section, California Department of Fish and Game, Sacramento 14, Calif., 1963.

BIOCHEMISTRY:

On Changes in the Myosin Fraction of Fish Muscle on Freezing, Cold-Storage, and Thawing, by O. E. Nikkila, Translation No. 5547, 4 pp., processed. (Translated from the Russian, *Kemia*, vol. IV, no. 12, 1957, pp. 3-7.) Commonwealth Scientific and Industrial Research Organization, 314 Albert St., East Melbourne C2, Australia, 1961.

"Observations on the Post-Mortem Biochemical Changes in Fish Muscle in Relation to Rigor Mortis," by N. Tomlinson and others, article, *Journal of the Fisheries Research Board of Canada*, vol. 18, 1961, pp. 321-336, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"On the Source of Free Ribose Formed Post-Mortem in the Muscle of Lingcod (*Ophiodon elongatus*)," by N. Tomlinson and V. M. Creelman, article, *Journal of the Fisheries Research Board of Canada*, vol. 17, 1960, pp. 603-606, illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

BRAZIL:

Sudene, Boletim de Estudos de Pesca, vol. 2, no. 11, November 1962, 21 pp., processed in Portuguese. Departamento de Estudos Especiais, Divisao de Pesca, Superintendencia do Desenvolvimento do Nordeste, Edificio Juscelino Kubitschek, 12º Andar, Recife, Pernambuco, Brazil. Includes, among others, these articles: "Apreciacao Sumaria da Sitacao das Pescas Brasileiras" (Summary Appraisal of the Position of the Brazilian Fisheries); "Estudos de Biologia da Pesca de Lagostas" (Biological Studies of the Spiny Lobster Fishery); "Pesca do Xareu na Bahia e sua Tradiacao Historica" (Yellow Mackerel in Bahia and Its Life History), by Vicente Antao de Carvalho; "A Pesca Maritima em Pernambuco" (The Marine Fishery in Pernambuco); and "Completa Trinta Anos de Existencia o Servico de Piscicultura" (The Fish Culture Service Completes 30 Years of Existence).

Sudene, Boletim de Estudos de Pesca, vol. 3, no. 5, May 1963, 28 pp., processed in Portuguese. Departamento de Industrializacao, Divisao de Pesca, Superintendencia do Desenvolvimento do Nordeste, Edificio Juscelino Kubitschek, 12º Andar, Recife, Brazil. Includes, among others, articles on: "Consumo de Pescado no Nordeste" (Fish Consumption in the Northeast); "Estudo da Biologia e Pesca da Lagosta" (Biology and Fishery Study of the Spiny Lobster), by Gercilde de A. Borges; and "Pescaria do Atuneiro Kaiko Maru 12" (Fishing by the Tuna Vessel *Kaiko Maru 12*), by Silvio B. Morais.

Sudene, Boletim de Estudos de Pesca, vol. 3, no. 6, June 1963, 30 pp., illus., processed in Portuguese. Departamento de Industrializacao, Divisao de Pesca, Superintendencia do Desenvolvimento do Nordeste, Edificio Juscelino Kubitschek, 12º Andar, Recife, Brazil. Includes, among others, these articles: "Desenvolvimento da Producao Pesqueira Nordestina" (Development of Fishery Production in the Northeast); and "Biologia e Pesca da Lagosta" (Spiny Lobster Biology and Fishery), by Gercilde de A. Borges.

CALIFORNIA:

Statistical Report of Fresh, Canned, Cured and Manufactured Fishery Products for 1962, Circular No. 37, 15 pp., printed. Biostatistical Section, Marine Resources Operations, Sacramento, Calif., 1963.

CANADA:

A Brief Review of the Fisheries of Nova Scotia, by John W. Watt, 79 pp., processed. Fisheries Division, Department of Trade and Industry, Province of Nova Scotia, Halifax, Nova Scotia, Canada, May 1963. Discusses the birth and growth of the salt fish industry (1497-1885), decline of the salt fish industry (1886-1939), the transition from salt fish to fresh fish (1850-1939), and the fishing industry (1940-1963). The Nova Scotia Government created a

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Fisheries Division in 1943. Its first annual report outlined proposals that included: (1) reorganization of the Fishermen's Loan Board to provide funds for improved types of boats and vessels; (2) vocational training for fishermen; (3) large capital contributions for fish-freezing plants; and (4) financial assistance for small or "intermediate" ports or areas.

Costs and Earnings of Selected Fishing Enterprises, Atlantic Provinces, 1961, by John Proskie, Primary Industry Studies no. 1, vol. 11, 200 pp., illus., processed. Economics Service, Department of Fisheries of Canada, Ottawa, Canada, 1963. This is an annual progress report on a study of the economics of 140 primary fishing enterprises. The enterprises are grouped in 21 classes according to region and type and size of fishing craft and gear employed. In the first part, the findings for the 1961 season are compared with those available for earlier seasons. The second part includes detailed tables summarizing the fishing activities and financial results for the enterprises included in the 1961 phase of the study. The study in 1961 was extended to include for the first time a sample of Nova Scotia and New Brunswick gill-netters and a sample of Danish seiners in New Brunswick.

CARP:

"Carp Study," by R. J. Robel, article, Utah Fish and Game, vol. 19, no. 8, August 1963, pp. 20-21, illus., printed, single copy 25 cents. Utah State Department of Fish and Game, 1596 W. North Temple, Salt Lake City 16, Utah. In 1959, the Utah State Department of Fish and Game in cooperation with other agencies initiated a joint 3-year study to help determine the effect of carp on waterfowl food plant production. Results showed that carp adversely affect the production of sago pondweed. Even low populations of carp reduce the growth of this important waterfowl food plant.

CEYLON:

Preliminary Bibliography of Fish and Fisheries in Ceylon, IPFC Occasional Paper 1962/5, printed. Indo-Pacific Fisheries Council, FAO Regional Office for Asia and the Far East, Malian Mansion, Phra Atit Rd., Bangkok, Thailand, 1962.

CLAMS:

Serial Atlas of the Marine Environment--A Geographic Study of the Clam, SPISULA POLYNYMA (Stimpson), by J. Lockwood Chamberlin and Franklin Stearns, Folio 3, 18 pp., illus., printed, \$8. Serial Atlas of the Marine Environment, American Geographical Society, Broadway at 156th St., New York 32, N. Y., September 1963. A geographic study of a clam, designed to show how maps can be used to analyze the environmental factors which determine why marine animals live where they do. The clam, Spisula polynyma, is an edible though commercially unimportant species found in both the Atlantic and Pacific oceans. On specially prepared maps, the authors plot what is actually known about the geographical distributions of the clam and show how the two chief controlling factors--bottom temperatures and bottom sediments--determine where the clam lives. The basic importance of the study for scientists and, eventually, for commercial fisheries lies in the method of cartographic analysis developed by the study. The clam study forms Folio 3

of the Serial Atlas, which is being issued as a series of separate folios, each a complete study in itself of a physical, biological, chemical, or geological aspect of the ocean. The two earlier folios dealt with sea surface temperatures in the western North Atlantic and with temperatures at a depth of 200 meters throughout the North Atlantic.

CLUP:

"Zamorazivanie e Hranenie Salaki v Al'ginatom Zely" (Freezing and Storage of Clup in an Alginate Jelly), by G. C. Konokotin and L. I. Zuikova, article, Rybnoe Khoziaistvo, vol. 36, no. 10, 1960, pp. 67-70, illus., printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R. Clup, a fish peculiar to the Baltic Sea where it is caught on an industrial scale, has a short storage life. It can be stored only 24 hours under cooling. The authors developed an alginate jelly for the freezing and storage of clup for 12 months in cold rooms at -4° F. The solution for the preparation of the jelly is made up of 1.0 percent sodium alginate, 1.0 percent lactic acid and 0.05 percent of calcium chloride. This solution becomes solid at 34° F. and its pH is 3.5.

COLOMBIA:

Establishing a Business in Colombia, by Herbert A. Lindow, OBR 63-107, 16 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., August 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses investment opportunities, amount and type of U. S. investment, joint ventures, licensing and technical assistance, and rights of foreigners. Also covers entry and repatriation of capital and exchange rates, business organization, industrial property protection, labor legislation, taxation, and exports.

COMPOSITION:

Status of Importance of Minor Elements in Food, Especially in Fish, by J. Kuhnau, paper presented at FAO International Conference on Fish in Nutrition, Washington, D. C., 19-27 September 1961, printed. University of Hamburg, Hamburg, Germany.

CONTAINERS:

Etude de la Corrosion des Boites de Conservees par les Sardines a l'Huile (Study of Rusting of Cans of Sardines in Oil), by R. Meesemaeker and others, 19 pp., illus., processed in French. Federation des Industries de la Conserve au Maroc, 291 Bd. Mohammed V, Casablanca, Morocco, March 1963.

COOPERATIVES:

Problems of Cooperation (A Discussion Group Guide), by Emory S. Bogardus, 102 pp., printed, 75 cents. The Cooperative League of the U. S. A., 343 Dearborn St., Chicago 4, Ill. The questions and the accompanying materials will enable discussion groups to follow a systematic plan in considering the problems and the accompanying activities of a cooperative. Each cooperative will have problems peculiar to itself. Yet basic to these problems are certain essentials of efficient cooperative procedure. These are emphasized throughout this booklet as a background for stimulating worthwhile discussions. This study guide will be found useful for members of all types of cooperatives--consumer cooperatives, farm

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supply cooperatives, producer and marketing cooperatives, and all those that deal in services of one kind or another.

CORALS:

Corals (New Genera and Genotypes), by E. D. Soshkina, 16 pp., processed. (Translated from the Russian, Trudy Paleontologicheskogo Instituta, vol. LVI, 1955, pp. 118-128.) Paleontology and Stratigraphy Branch, U. S. Geological Survey, Washington, D. C., September 1960.

CRABS:

"Transport of Common Crab (Scylla serrata) in Living Condition", by R. B. Vasudeo and H. G. Kewalramani, article, Indian Journal of Fisheries, vol. 7, no. 1, pp. 169-173, illus., printed. Indian Journal of Fisheries, Ministry of Food and Agriculture, New Delhi, India.

The following publications, presented at a Special Meeting on Crustacea held in 1962, are available from the International Council for the Exploration of the Sea, Charlottenlund Slot, Denmark:

Observations on Growth of the Edible Crab (CANCER PAGURUS), by E. Edwards, Special Meeting on Crustacea No. 15, 19 pp., illus., processed.

Yield Assessment in the Norfolk Fishery for Crabs (CANCER PAGURUS), by D. A. Hancock, Special Meeting on Crustacea No. 27, 19 pp., illus., processed.

The Possible Use of Fish Meal as a Bait for Catching Crabs, by James Mason, Special Meeting on Crustacea No. 19, 2 pp., processed.

The Scottish Crab-Tagging Experiments, 1960-61, by James Mason, Special Shellfish Symposium No. 18, 18 pp., illus., processed.

DIRECTORIES:

Fisheries Year-Book and Directory, 1963, illus., printed, 30 s. (about US\$4.20). British-Continental Trade Press, Ltd., 222 Strand, London, England. Gives details and statistics of the turnover of fresh, frozen, cured, and canned fish, fish meal, and oil. A chapter on the construction and equipment of fishing vessels describes features of interesting new vessels built in 1962, and lists the vessels built or under construction. The reference section includes a dictionary of fish names in eight languages; a fish supply calendar; a list of the fishery organizations throughout the world; and a world directory giving the particulars of over 5,000 firms in 68 countries, including fishing companies, wholesalers, importers, canners, firms dealing in fish byproducts, suppliers of machinery, equipment and packing materials, cold storage and transport firms; a list of trade marks; and a classified guide for buyers. Special features include a progress report on the work in the preservation of fish at the Torry Research Station; recommended recipes; a review of current developments in the fish meal industry; and a detailed description of a Russian floating fish cannery.

Marine Digest Pacific Northwest Maritime Directory and World-Wide Shipping Guide, 1963, 393 pp., illus., printed, \$2. Marine Digest Publishing Company, 79 Columbia St., Seattle 4, Wash. The worldwide shipping guide of steamship services from Washington, Oregon, and British Columbia areas lists ports alphabetically in the region of the world where they are situated. Under each port are the lines that maintain a service into that port from the Pacific Northwest. In the directory, key personnel of leading companies are cross-indexed. Also includes a marine buyers' guide which lists alphabetically a number of products and services.

World Directory of Hydrobiological and Fisheries Institutions, edited by Robert W. Hiatt, 320 pp., printed. American Institute of Biological Sciences, 2000 P St. NW., Washington, D. C., 1963.

DOGFISH:

"Norske Pigghamerkninger 1962" (Norwegian Spiny Dogfish Tagging, 1962), by Olav Aasen, article, Fiskets Gang, vol. 49, no. 31, August 1, 1963, pp. 455-460, illus., printed in Norwegian with English summary. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

EELS:

Some Data on Eel Culture in Japan, IPFC Occasional Paper 1962/6, printed. Indo-Pacific Fisheries Council, FAO Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand, 1962.

FEEDS:

"Choice Sea Food for Farm Animals", by Clarence F. Winchester, article, Feedstuffs, July 6, 1963, printed. Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis 5, Minn.

FISH COOKERY:

Cuisson a la Vapeur sous Pression de la Sardine et du Thon (Cooking with Steam under Pressure of Sardines and Tuna), by R. Meesemaecker and Y. Sohler, 10 pp., illus., printed in French. (Reprinted from Revue de la Conserve, April 1963.) Societe d'Edition pour l'Alimentation, 1 Rue de la Reale, Paris 1, France.

FISHERIES ADMINISTRATION:

Planning for Fisheries Development and Fisheries Administration, IPFC Occasional Paper 1963/5, printed. Indo-Pacific Fisheries Council, FAO Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand, 1963.

FISHERY RESEARCH:

Research in Fisheries, 1962, Contribution No. 147, 70 pp., illus., printed. Fisheries Research Institute, University of Washington, Seattle 5, Wash., March 1963. Presents papers on Alaska salmon studies, other fish projects, ecology and taxonomy, shellfish, food science, and related subjects.

FISH MEAL:

Capacidad de Produccion de la Industria de Harina de Pescado en el Peru (Production Capacity of the Fish Meal Industry in Peru), by I. Tilic, Informe No. 4, printed in Spanish. Instituto de Investigaciones de los Recursos Marinos, Callao, Peru, 1962.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Nuevo Embalaje para Proteccion y Conservacion Eficientes de la Calidad de la Harina de Anchoveta (New Packaging for the Efficient Protection and Preservation of the Quality of Anchovy Meal), by E. Arnesen and others, Informe No. 6, printed in Spanish. Instituto de Investigaciones de los Recursos Marinos, Callao, Peru, 1962.

La Ubicacion de la Industria Peruana de Harina de Pescado (The Position of the Peruvian Fish Meal Industry), by I. Tilic, Informe No. 3, printed in Spanish. Instituto de Investigaciones de los Recursos Marinos, Callao, Peru, 1962.

FISH OIL:

Fish Oils in Relation to Blood Cholesterol and Cardiovascular Diseases, by H. Dam and E. Lund, paper presented at FAO International Conference on Fish in Nutrition, Washington, D. C., 19-27 September 1961, printed. Polytechnic Institute, Copenhagen, Denmark.

FISH POPULATIONS:

Four Articles on the Management of Fisheries and Dynamics of Fish Populations, OIS 63-22056, 46 pp., processed. (Translated from the Russian, Ichthyology Commission Conferences Proceedings, no. 13, 1961.)

FISH PROTEIN CONCENTRATE:

Effect of Several Processing Variables on the Protein Content and Quality of Fish Flour, by C. H. Kurtzman and others, paper presented at FAO International Conference on Fish in Nutrition, Washington, D. C., 19-27 September 1961, printed. Food and Flavor Laboratory, Arthur D. Little, Inc., Cambridge, Mass.

FOOD AND AGRICULTURE ORGANIZATION:

Current Bibliography for Aquatic Sciences and Fisheries, by L. Otto, processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962.

Directorio de Servicios e Instituciones de Pesca en America Latina, Provisional (Directory of Fishery Services and Institutions in Latin America, Provisional), printed in Spanish. Regional Fisheries Officer, Oficina Regional de la FAO, Casilla 10095, Santiago, Chile, 1962.

Proceedings of the World Scientific Meeting on the Biology of Tunas and Related Species, La Jolla, California, 2-14 July 1962, Vol. I--Report, Fisheries Report No. 6, printed. Technical Writer's Unit, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1963.

Provisional Directory of Fisheries Institutions in Africa, printed. Regional Fisheries Officer, FAO Regional Office for Africa, P. O. Box 1628, Accra, Ghana, 1962.

Report on the FAO/IPFC Regional Training Center on Fish Processing Technology. Part I--Organization of the Training Center; Part II--Country Surveys on Fish Utilization in the Indo-Pacific Region, edited by R. Kreuzer, Fisheries Report No. 4,

printed. Technical Writer's Unit, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962.

The Food and Agriculture Organization has published a report describing that Agency's activities under the Expanded Program for Technical Assistance for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Rapport au Gouvernement de la Republique du Viet-Nam sur l'Organisation et le Fonctionnement d'un Centre de Perfectionnement pour les Pecheurs (Report to the Government of Viet-Nam on the Organization and Operation of a Center for the Improvement of Fishing Vessels), FAO/EPTA Report No. 1494, 22 pp., illus., processed in French, 1962.

FOOD MANAGEMENT:

Good Receiving Practices, by Charles E. Eshbach, Food Management Program Folder No. 1, 6 pp., illus., printed. Cooperative Extension Service, College of Agriculture, University of Massachusetts, Amherst, Mass. Discusses a four-step receiving program for receiving clerks. The program includes: checking--weight, count, quality of each item received; recording--price, count, weight, and deficiencies; storing--immediately, in the proper places, and at correct temperature; and reporting all items that do not meet standards. Following this program insures efficient receiving, reduces losses, holds down costs, and results in a more successful food service operation. Although this leaflet does not refer to fishery products specifically, it applies to them as well as to other types of foods.

FREEZE-DRYING:

Freeze-Drying of Foods, a List of Selected References, compiled by Geraldine A. Corridon, Library List No. 77, 83 pp., processed. National Agricultural Library, U. S. Department of Agriculture, Washington, D. C., 20250, July 1963. This bibliography has been compiled as an early step in the economic appraisal of freeze-drying. It covers the period from January 1954 through August 1962, with a few earlier citations and some representative current references indicating the nature and trend of recent development. Although emphasis throughout is on food, some material on general basic principles and historical development has been included.

FRESH FISH:

"Pre-Packing Unfrozen Fish," by J. M. Shewan and G. Hobbs, Torry Memoir No. 132, 3 pp., illus., printed. (Reprinted from Fishing News International, January 1963.) Arthur J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

FROZEN FOOD:

Electronic Frozen Food Thawing, 12 pp., processed. Radyne Ltd., Eastheath Ave., Wokingham, Berkshire, England.

GEAR:

The Efficiency of the Gourdon Crab Creel, by James Mason, Special Meeting on Crustacea No. 12, 5 pp.,

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illus., processed. International Council for the Exploration of the Sea, Charlottenlund Slot, Denmark, 1962.

"Problems in the Use of Plastics in Fishing," by J. H. White, A. Abramov, and B. Komarovskiy, Technical Paper No. 41, 2 pp., printed. (Reprinted from General Fisheries Council for the Mediterranean, Proceedings and Technical Papers, No. 6, 1961, pp. 283-284.) General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

"The Use of Machine-Made Net Webbing for Mediterranean Trawl Nets," by M. Ben-Yami, Technical Paper No. 13, 5 pp., illus., printed in English with French abstract. (Reprinted from General Fisheries Council for the Mediterranean, Proceedings and Technical Papers, No. 6, 1961, pp. 131-135.) General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

GREAT LAKES:

(Great Lakes Fishery Commission) Annual Report for the Year 1961, 59 pp., printed. Great Lakes Fishery Commission, Natural Resources Bldg., the University of Michigan, Ann Arbor, Mich. Presents sections on the 1961 annual meeting proceedings; administrative report for 1961; lamprey control and research in Canada, the United States, and by cooperating agencies; lake trout rehabilitation and assessment; and a summary of fishery research in the Great Lakes in 1961.

HERRING:

"Chemical Studies on the Herring (*Clupea harengus*). I--Trimethylamine Oxide and Volatile Amines in Fresh, Spoiling and Cooked Herring Flesh," by R. B. Hughes, article, Journal of the Science of Food and Agriculture, vol. 10, 1959, pp. 431-436, illus., printed. The Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

Herring Industry Board. Twenty-Eighth Annual Report, 1962, 50 pp., printed. Her Majesty's Stationery Office, York House, Kingsway, London WC2, England, 1963.

HILSA:

Synopsis of Biological Data on Hilsa, HILSA ILISHA (Hamilton) 1822, by S. R. Pillay and H. Rosa, Jr., FAO Fisheries Biology Synopsis No. 25, 69 pp., illus., processed. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, January 1963.

HOGFISH:

"Color Pattern Changes during Growth of *Bodianus pulchellus* and *B. rufus* (Pisces: Labridae)," by Henry A. Feddern, Contribution No. 469, 18 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 13, no. 2, June 1963, pp. 224-241.) The Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

INDONESIA:

Preliminary Bibliography of Fish and Fisheries in Indonesia, IPFC Occasional Paper 1962/4, printed. Indo-Pacific Fisheries Council, FAO Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand, 1962.

INLAND FISHERIES:

European Inland Fisheries Advisory Commission, Report, Second Session, Paris, France, 12 May 1962, printed in French and English. European Inland Fisheries Advisory Commission, c/o Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

A Provisional List of Inland Fishery Workers in Europe, Fisheries Biology Technical Paper No. 15, printed. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1961.

JAPAN:

A Brief Note on the Fisheries Extension Service in Japan, IPFC Occasional Paper 1963/1, printed. Indo-Pacific Fisheries Council, FAO Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand, 1963.

Coastal Sea Fishery, by C. Miyazaki, 381 pp., illus., printed in Japanese, 850 Yen (about US\$2.36). Fishery Methods Section, Tokai Fisheries Laboratory, Fishery Agency, Tsukishima, Chuo-Ku, Tokyo, Japan. Describes the types of gear and fishing methods used in the coastal fishery of Japan.

KING CRAB:

The following publications, presented at a Special Meeting on Crustacea held in 1962, are available from the International Council for the Exploration of the Sea, Charlottenlund Slot, Denmark:

On the Introduction of the Commercial Crab, PARALITHODES CAMSCHATICA (Tilesius), into the Barents Sea, by Ju. I. Orlov and A. F. Karpevich, Special Meeting in Crustacea No. 34, 3 pp., processed.

Preliminary Report of the Effect of Varying Levels of Fishing on Eastern Bering Sea King Crabs, PARALITHODES CAMSCHATICA (Tilesius), by Takashi Miyahara and Herbert H. Shippen, Special Meeting on Crustacea No. 38, 26 pp., illus., processed.

LABOR LEGISLATION:

Provisions of the Fair Labor Standards Act Applicable to Fishing and Operations on Aquatic Products under the Fair Labor Standards Act of 1938, as Amended (Text of the Code up to and including January 1, 1962, and any Federal Register Amendments Issued Thereafter, up to and including January 31, 1963), 29 pp., printed, 1963. Wage and Hour and Public Contracts Divisions, U. S. Department of Labor, Washington, D. C. 20210. Purpose of this bulletin is to provide an official statement of the views of the Department of Labor with respect to the application and meaning of those provisions of the Fair Labor Standards Act which govern rights and obligations of employees and employers in the various enterprises engaged

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in fishing and related activities and in operations on aquatic products. The application of the Act to employment in such enterprises was broadened by amendments effective September 3, 1961. Under the amended Act, a substantial number of employees working in the processing (except canning), marketing, freezing, curing, storing, packing for shipment, or distributing of fish, shellfish, or other aquatic forms of animal or vegetable life and their byproducts will be subject to its minimum wage provisions for the first time. Also, certain employers engaged in some of these activities have employees who are newly subject to the Act under the amendments extending coverage to employees employed in specified enterprises engaged in commerce or in the production of goods for commerce. An exemption from minimum wages as well as overtime pay has been extended by the 1961 amendments to certain employees working in canning of marine products at sea. The bulletin's objective is to make available in one place, for the information of those who may be concerned with these and related provisions of the law, the official interpretations of such provisions by which the Department of Labor will be guided in carrying out its responsibilities under the Act.

LAKE ERIE:

The Lake Erie Fishing Industry; Report Dealing with Representations Made to the Provincial Government in 1962, 34 pp., printed. Department of Economics and Development, Toronto, Ontario, Canada, 1963.

LOBSTERS:

Freezing Whole Scampi Tails, by J. C. Early, Torry Research Report No. 5, 3 pp., illus., processed. Torry Research Station, 135 Abbey Rd., Aberdeen, Scotland.

"Phyllosoma Larvae Associated with Medusae," by Len R. Thomas, Collected Reprint 506, 1 p., printed. (Reprinted from *Nature*, vol. 198, no. 4876, April 13, 1963, p. 208.) Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Cronulla, Sydney, Australia.

The following publications presented at a Special Meeting on Crustacea held in 1962, are available from the International Council for the Exploration of the Sea, Charlottenlund Slot, Denmark:

Les Apports de Langoustines dans les Ports Belges (The Stocks of Lobsters in Belgian Ports), by E. Leloup and Ch. Gilis, Special Meeting on Crustacea No. 2, 3 pp., processed in French.

A Comparison of the Catch of Norway Lobsters Using Trawls of 50 and 70 mm. Respectively, by H. J. Thomas, Special Meeting on Crustacea No. 21, 4 pp., illus., processed.

The Distribution of the Norway Lobster around Scotland and the Stock Composition of the Norway Lobster in Areas of Different Fishing Intensity, by H. J. Thomas, Special Shellfish Symposium No. 16, 17 pp., illus., processed.

The German Nephrops Fishery, by E. Aker and K. Tiews, Special Meeting on Crustacea No. 4, 3 pp., illus., processed.

The Growth of Norway Lobsters in Aquaria, by H. J. Thomas, Special Meeting on Crustacea No. 23, 8 pp., illus., processed.

Lobster Conservation in Canada, by D. G. Wilder, Special Meeting on Crustacea No. 10, 8 pp., illus., printed.

The Lobster Fishery of the South-East Scottish Coast, by H. J. Thomas, Special Meeting on Crustacea No. 22, 9 pp., illus., processed.

Nephrops Norvegicus Fishing Grounds around the Irish Sea, by C. O'Riordan, Special Meeting on Crustacea No. 11, 4 pp., processed.

The Nephrops in the Skagerak and Kattegat (Length, Growth, Tagging Experiments and Changes in Stock and Fishery Yield), by Aage J. C. Jensen, Special Meeting on Crustacea No. 36, 6 pp., illus., processed.

Observations sur le Stock de Langoustines (NEPHROPS NORVEGICUS L.) du Golfe de Gascogne à l'Ecosse (Observations on the Stock of Lobsters (Nephrops norvegicus L.) in the Gulf of Gascony and Scotland), by L. Faure, Special Meeting on Crustacea No. 6, 5 pp., illus., processed in French.

A Preliminary Report on the Norway Lobster (NEPHROPS NORVEGICUS) in Icelandic Waters, by A. Sigurdsson, Special Meeting on Crustacea No. 32, 5 pp., illus., processed.

Pre-Moult Changes in Structure of the Integument of the Lobster, HOMARUS VULGARIS, by B. T. Hepper, Special Meeting on Crustacea No. 13, 12 pp., illus., processed.

Selection by Trawl Nets in the Nephrops Fishery, by H. A. Cole and A. C. Simpson, Special Meeting on Crustacea No. 25, 2 pp., illus., processed.

Selectivite des Chaluts a Langoustines (NEPHROPS NORVEGICUS L.) (Selectivity of Trawls for Lobsters (Nephrops norvegicus L.)), by J. Ancellin, Special Meeting on Crustacea No. 7, 1 p., processed in French.

The Size Distribution of Nephrops Populations on Grounds around the British Coasts, by H. A. Cole, Special Meeting on Crustacea No. 24, 13 pp., illus., processed.

A Summary of Scottish Comparative Fishing Experiments on NEPHROPS NORVEGICUS, by J. A. Pope and H. J. Thomas, Special Shellfish Symposium No. 17, 19 pp., illus., processed.

Variations in the Catches of NEPHROPS NORVEGICUS at Different Times of Day and Night, by A. C. Simpson, Special Meeting on Crustacea No. 26, 5 pp., illus., processed.

MACKEREL:

Larvae of Mackerel-Like Fish (Pisces, Scombriformes) from the Indian Ocean, by N. N. Gorbunova, OTS 63-22088, 35 pp., processed. (Translated from the Russian, Proceedings of the Institute of Oceanography, 1963.) Office of Technical Services, U. S.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Department of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington, D. C.

MARINE ALGAE:

Some Marine Algae from Ceylon--1, by M. Durairatnam, Bulletin No. 15, 14 pp., printed. Fisheries Research Station, Department of Fisheries, Colombo, Ceylon, 1962.

MARINE BIOLOGY:

Aspects of Deep Sea Biology, by N. B. Marshall, 378 pp., illus., printed. Philosophical Library, 15 E. 40th St., New York 16, N. Y., 1954.

United States Antarctic Research Program, National Science Foundation, 35 pp., illus., printed. National Science Foundation, Washington, D. C., 20550, May 1963. The United States is one of 12 nations participating in a cooperative scientific effort to learn more about a little-known area that covers almost 7 percent of our globe. Antarctica is a vast natural laboratory affording a relatively simple and uncontaminated environment for the study of phenomena that have direct bearing on many similar and analogous phenomena throughout the rest of the world. Marine biology in the rich Antarctic seas is of particular interest in view of the need to develop additional food resources for an expanding world population, and also because of the low level of radioactive contamination in southern oceans. Studies are being made of the vertebrate and invertebrate fauna, plankton communities, microbiological organisms, and the productivity of the waters. Adequate collections of specimens and water samples and their systematic description are requisites to these studies.

MARINE BORERS:

"Some Aspects of Marine Borer Problems in India," by N. B. Nair, article, Journal of Scientific and Industrial Research, India, vol. 20A, no. 10, 1961, pp. 584-591, printed. Council of Scientific and Industrial Research, Old Mill Rd., New Delhi 2, India.

MARKETING:

Rules and Specifications Applicable to Futures Trading in Frozen Shrimp for January, March and September 1964 Delivery, 8 pp., printed. Chicago Mercantile Exchange, 110 N. Franklin St., Chicago 6, Ill. Explains shrimp classification and grade, trading unit on futures call, futures price fluctuations and limits, deliveries and substitutions on the futures call, and permissible substitutions in sizes of shrimp. Also discusses inspection certificates, life of inspection certificate, storage charges on futures, speculative position limit, commission charges, and warehouses approved for shrimp deliveries. Included are statistical tables showing monthly ex-vessel headless shrimp prices at Port Isabel and Brownsville, Texas, for 1960-1962, and January-August 1963; Texas shrimp landings, 1961-1962, and January-August 1963; and United States frozen shrimp cold storage stocks, 1959-1962, and January-October 1963.

MOROCCO:

Foreign Trade Regulations of Morocco, OBR 63-110, 8 pp., processed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Wash-

ington, D. C., July 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) Discusses trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, Morocco's export controls, United States controls, and Government representation in the United States. A special tax is levied on industrial fish.

NEW ZEALAND:

"The Supra-Littoral Fringe of New Zealand Sand Beaches," by R. J. MacIntyre, 15 pp., illus., printed. (Reprinted from Transactions of the Royal Society of New Zealand, General, vol. 1, no. 8, August 8, 1963, pp. 89-103.) Royal Society of New Zealand, c/o Victoria University of Wellington, P. O. Box 196, Wellington, New Zealand.

OCEANOGRAPHY:

Australian Tide Recorders, by B. V. Hamon, Technical Paper No. 15, 33 pp., illus., printed, 1963. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Cronulla, Sydney, Australia.

Considerations on Fishery Oceanography, by Z. Popovici, Fisheries Biology Technical Paper No. 29, printed. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1963.

Coordination of Federal Oceanography, by Robert Walden Coggeshall, Bulletin 8, printed, \$2.50. Center for Technology and Administration, the American University, 1901 F St. NW., Washington 6, D. C. Documents the current history of the search for appropriate and effective means to coordinate Federal oceanography.

International Marine Science, vol. 1, no. 1, April 1963, printed. Fisheries Biology Branch, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. The first issue of a new quarterly publication devoted to oceanography, prepared jointly by UNESCO and FAO. Includes editorial notes; international, regional, and national organizations including their purposes, functions, and structures; national oceanographic programs; international projects; meetings; training facilities, including seminars, available fellowships; miscellaneous news items; and activities of the UN and other agencies.

Man and the Sea, by Dan Q. Posin, 127 pp., illus., printed, \$2.95. Lyons (Meredith), 2500 Prairie Ave., Chicago 16, Ill., 1963.

Oceanographic Observations in the Intertropical Region of the World Ocean during IGY and IGC. Part IIa--Pacific Ocean (France, Japan and Union of Soviet Socialist Republics), IGY Oceanographic Report Number 3, 232 pp., illus., processed. Department of Oceanography and Meteorology, Agricultural and Mechanical College of Texas, College Station, Tex., September 1961.

Oceanography, the Ten Years Ahead--A Long Range National Oceanographic Plan, 1963-1972, ICO Pam-

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phlet No. 10, 64 pp., illus., printed. Interagency Committee on Oceanography, Federal Council for Science and Technology, Office of Naval Research, Rm. 1818, 17th St. and Constitution Ave. NW., Washington, D. C., 20360, June 1963. Discusses why a long-range plan is needed, for whom it is written, and what this plan is supposed to do; national goals in oceanography--strengthening basic science, improving national defense, managing resources in the world ocean, managing resources in domestic waters, protecting life and property ashore and insuring the safety of operations at sea; and special groups concerned with oceanography--oceanographic science, the fishing industry, offshore oil industry, the sea-mining industry, shipping, and recreation industry. Also covers capabilities and systems to support oceanographic goals--strengthening basic science, defense, world ocean resources, safety at sea and protection ashore, services, instrumentation, and manpower; surveys and services--ocean survey plan, the National Oceanographic Data Center, Navy's Oceanographic Instrumentation Center, and Oceanographic forecasting service; the international setting--U. S. S. R., Japan, United Kingdom, and Canada; program summary and evaluation; and organizational problems.

Osnovy Ucheniia o Rezvitiu Morskikh Beregov (Fundamentals of the Science of the Development of Sea Shores), by V. P. Zenkovich, 710 pp., illus., printed in Russian. Academy of Sciences of the U. S. S. R., Moscow, U. S. S. R., 1962. Discusses basic ideas on the hydrodynamics of the coastal zone, sea deposits and their transverse displacement, the abrasion process and factors determining it, profiles of underwater slope in natural conditions, above-water elements of the shore zone, and transport of deposits along the shore. Also covers accumulative forms of shore zones, bay shores and their evolution, phases of shore evening, the development of shores by vertical movements, the effect of rivers and fluvial deposits on the development of the sea-shore, eolian processes on seashores, shore formations caused by tides and storm convergencies, and some tasks of further research.

--Milan A. Kravanja

Standard Encyclopedia of the World's Oceans and Islands, edited by Anthony Huxley, 383 pp., illus., printed, \$10.95. G. P. Putnam's Sons, 210 Madison Ave., New York 16, N. Y., 1962.

OTTER TRAWLS:

"O Vyborie Ratzional'noy Formy Tralovoy Doski" (Choosing Rational Shape of Otter Boards), by I. R. Matrosov, article, Rybnoe Khoziaistvo, vol. 34, no. 1, 1958, pp. 36-42, illus., printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

OYSTERS:

Bibliography on Pearl Oysters, by S. Sivalingam, Bulletin No. 13, 18 pp., printed. Fisheries Research Station, Department of Fisheries, Colombo, Ceylon, 1962.

The California Oyster Industry, by Elinore M. Barrett, Fish Bulletin 132, 103 pp., illus., printed. Printing Division, Documents Section, California

Department of Fish and Game, Sacramento, Calif., 1963. California was the leading Pacific coast oyster producer during the latter half of the 19th century. After the decline early in this century of the San Francisco Bay oyster industry based on young oysters imported from the East Coast, the California industry had a marginal existence until a major revival of the industry in the mid-1950's. At that time, large-scale plantings of young oysters imported from Japan raised California oyster production to a level similar to that achieved in the late 19th century. By volume, California in 1958 was second ranking oyster producer on the Pacific coast, and seventh among all United States oyster-producing states.

PESTICIDES:

"Insecticides: Effects on Cutthroat Trout of Repeated Exposure to DDT," by Don Allison and others, article, Science, vol. 142, no. 3594, November 15, 1963, pp. 958-961, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1516 Massachusetts Ave. NW., Washington, D. C. 20005.

"Pesticide Fish Kills," article, Outdoor California, vol. 24, no. 9, September 1963, pp. 3-4, illus., printed. California Department of Fish and Game, 722 Capitol Mall, Sacramento, Calif.

PHYSIOLOGY:

Ekologicheskaiia Fiziologiia Ryb. Tom I (Ecological Physiology of Fishes, Part I), by N. S. Stroganov, 444 pp., printed in Russian. Izdatel'stvo Moskovskogo Universiteta, Moscow, U. S. S. R., 1962. This book is the collection of lectures held by Prof. Stroganov since 1937 at the Chair of Hydrobiology of the Biological Faculty of Moscow State University, first under the title Physiology of Fishes and since 1949 as Ecological Physiology of Fishes. The term is defined by Prof. Stroganov as that part of physiology which studies the laws of physiological processes in an organism and their dependence on environmental conditions. The book is divided into 9 chapters as follows: (1) chemical composition of the fish body; (2) skin cover; (3) blood; (4) blood circulation; (5) breathing; (6) interchange of gases; (7) feeding; (8) assimilation and dissimulation; and (9) reproduction. An exhaustive bibliography follows each chapter citing references to works in Russian, English, German, French, Japanese, and other languages.

--Milan A. Kravanja

PLANKTON:

"Comparison of Zooplankton Biomass Determinations by Indian Ocean Standard Net, Juday Net and Clark-Bumpus Sampler," by D. J. Tranter, Collected Reprint 497, 5 pp., illus., printed. (Reprinted from Nature, vol. 198, no. 4886, June 22, 1963, pp. 1179-1180.) Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Cronulla, Sydney, Australia.

The Cultivation of Marine Planktonic Diatoms and Dinoflagellates, by Yu. G. Kabanova, 26 pp., processed. (Translated from the Russian, Trudy Inst. Okeanol., vol. 47, 1961, pp. 203-216.) Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, Suffolk, England, 1962.

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POLLUTION:

"Estimation of the Damage to Fisheries Caused by Pollution," by J. A. Timmermans, article, Travaux Station de Recherches Groenendael, Ser. D., no. 34, 36 pp., printed in French. Station de Recherches, Groenendael, Jette, Belgium.

"Mortality Thresholds of Fish in Fly Ash Suspension, by J. M. Thomas, Collected Reprint 493, 1 p., illus., printed. (Reprinted from The Australian Journal of Science, vol. 25, no. 9, March 1963, p. 414. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Cronulla, Sydney, Australia.

POLYUNSATURATED FATTY ACIDS:

Polyunsaturated Acid in Fish Fat, in the Diet and in the Blood, by O. Notévarp and B. N. Cyvin, paper presented at FAO International Conference on Fish in Nutrition, Washington, D. C., 19-27 September 1961, printed. Norwegian Institute of Technology, Trondheim, Norway.

RADIOACTIVITY:

Ispol'zovanie Radioaktivnykh Izotopov v Rybnom Khozjaistve (The Use of Radioactive Isotopes in the Fishing Industry), by G. S. Karzinkin, 71 pp., printed in Russian. Piskchepromizdat, Moscow, U. S. S. R., 1962. Discusses the use of radioactive isotopes in fish tagging and in the study of fish metabolism. Also covers the use of radioactive potassium, radioactive phosphorus, strontium and yttrium, cerium, iron, cobalt, zinc, iodine, carbon, and sulfur.

RED SEA:

"The Israel South Red Sea Expedition," by O. H. Oren, article, Nature, vol. 194, June 23, 1963, pp. 1134-1137, printed. St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

"Israel's Red Sea Expedition," by O. H. Oren, article, Ariel, Summer Issue 1963, pp. 70-79, printed. Israel Government Printers, Ministry of Foreign Affairs, Cultural Relations Department, Jerusalem, Israel.

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"Research Vessel Kalava and Co-Operative Oceanographic Investigations in Indian Waters," by S. Jones, article, Journal, Marine Biological Association, India, vol. 1, no. 1, 1959, pp. 1-6, illus., printed. Marine Biological Association, Marine Fisheries Post Office, Mandapam, South India.

SALMON:

Abundance, Size, and Age of Red Salmon Smolts from the Wood River System, 1962, by Wilbur Church and Michael Nelson, Informational Leaflet No. 33, 11 pp., illus., processed. Alaska Department of Fish and Game, Support Bldg., Juneau, Alaska. Discusses methods, index of abundance, timing of the migration, and size and age composition. Also included are statistical data on Mosquito Point smolt catches, length frequencies of red salmon smolts, length and age of red salmon smolts, and season's weighted length frequency for 1962.

"The Investigation of Salmon Shark as a Predator on Salmon in the North Pacific, 1960," by Osamu Sano,

article, Bulletin of the Hokkaido Regional Fisheries Research Laboratory, no. 24, 1962, pp. 148-162, printed. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan.

Kvichak Salmon Studies: 1962 Spawning Ground Studies, by Wan Soo Kim and R. L. Demery, Circular No. 195, 26 pp., printed. Fisheries Research Institute, University of Washington, Seattle, Wash., 1963.

1959 Pink Salmon Catches in Canadian Waters North of the Convention Area, by A. S. Hourston, Manuscript Report Series (Biological) No. 750, 25 pp., printed. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1963.

1961 Pink Salmon Catches in Canadian Waters North of the Convention Area, by A. S. Hourston, Manuscript Report Series (Biological) No. 751, 23 pp., printed. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1963.

"Pitanie Molodi Semgi (*Salmo salar* L.) na Rannikh Stadiyakh Razvitiya pri Vyrashchivanii v Prudakh" (The Diet of Pond-Reared Young Salmon (*Salmo salar* L.) in the Early Stages of Development), by I. B. Bogatova, article, Voprosy Ikhtologii, vol. 2, no. 1, 1962, pp. 169-173, printed in Russian. Akademia Nauk SSSR, Ikhtologicheskaya Komissiya, Moscow, U. S. S. R.

Politics and Conservation, The Decline of the Alaska Salmon, by Richard A. Cooley, 251 pp., illus., printed, \$5, 1963. Harper and Row Publishers, Inc., 49 E. 33rd St., New York, N. Y., 10016. The purpose of this study is to trace the development of Federal policies for the conservation of the Alaska salmon resource in an effort to understand how the policies were formulated and executed, what major forces shaped their ultimate content, and why they have been so ineffective in maintaining the resource at a high level of production. Part one analyzes the environmental setting to determine the major factors which have conditioned the structure of the industry and the resulting pattern of exploitation. The research method used here is primarily statistical and economic analysis. Part two traces the historical development of the Federal conservation program, emphasizing the major issues and conflicts that evolved, the attitudes and activities of the various interest groups, and the public policies that resulted. This is based on a thorough examination of the written record as found in congressional hearings, committee reports, the Congressional Record, official reports of government agencies, enacted laws and policy statements, newspapers and trade journals, and the writings, addresses, letters, and reports of persons and organizations involved in the policy-formulating process. Part three presents the conclusions and evaluates their implications in terms of the probable future of the resource under State government administration.

Red Salmon Spawning Ground Surveys in the Nushagak and Togiak Districts, Bristol Bay, 1962, by Wilbur Church and Michael Nelson, Informational Leaflet No. 34, 24 pp., processed. Alaska Department of Fish and Game, Support Bldg., Juneau, Alaska, July 31, 1963. The purpose of the surveys was to pro-

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vide accurate estimates of abundance and distribution of red salmon in the various spawning areas. Such estimates are necessary to both research and management for optimum escapement studies and the attainment of escapement goals. The report discusses survey methods, total population estimates, estimates of spawning ground population in the Nushagak District, distribution of pink salmon in the Nushagak District, and estimates of spawning ground populations in the Togiak District. Also included are statistical tables giving data on comparisons of peak estimates in Wood River Lakes, Igushik Lakes and Lake Nunavagaluk, Tikchik Lakes and Nushagak-Mulchatna, and Togiak District; total population estimates of red salmon in the Nushagak District and Togiak District; and pink salmon data for Nuyakuk-Tikchik rivers.

"Rol'kormleniya i Podogreva Vody pri Iskusstvennom Vyrashchivanii Lososei v Zapolyar's" (The Role of Feeding and of Warming of the Water in the Artificial Rearing of Salmon above the Arctic Circle), by E. L. Bakshtanskii, article, *Rybnoe Khoziaistvo*, vol. 10, 1961, pp. 15-18, printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

SALMON AND TROUT:

"Investigation and Management of Atlantic Salmon and Trout. Part I--The Research Program; Part II--The Management Program," articles, *Trade News*, vol. 16, no. 1, July 1963, pp. 3-16, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Part I discusses salmon catch statistics since 1949, salmon research in the Maritime Provinces, salmon research in Newfoundland, trout limnological investigations, and trout research in Nova Scotia. Part II covers adult salmon transfers, proposed construction of new pulp mill, pollution investigations, salmon net mesh size experiment, Indian River diversion, lake investigations, engineering surveys, and construction projects in Newfoundland; Saint John River investigations, salmon tagging in Saint John Harbour, pollution investigations, Annapolis Aboideau fish passage studies, Tusket River survey, and early-run-late-run experiment in the Maritimes; engineering service including counting fences; and hatchery service.

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The Protection of Wood in Fish Rooms, by J. J. Waterman, *Torry Advisory Note No. 7*, 5 pp., printed, 1963. Torry Research Station, Aberdeen, Scotland.

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Existing Regulations for Sardine Fishing in the Mediterranean, GFCM Studies and Reviews No. 20, 27 pp., processed. General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Viale delle Termi di Caracalla, Rome, Italy, July 1963.

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"Distribution of the Sea Grass, *Thalassia*, in the United States," by Donald R. Moore, *Contribution No. 475*, 14 pp., printed. (Reprinted from *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 13, no. 2, June 1963, pp. 329-342.) The Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

SEA LAMPREY:

"Predation of the Sea Lamprey, *Petromyzon marinus*, on the Atlantic Mackerel, *Scomber scombrus*," by Grace L. Orton, article, *Copeia*, no. 3, 1962, pp. 663-665, printed. American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

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Ssaki Baltyku (Seals of the Baltic), by Andrzej Ropelewski, No. 3, 75 pp., illus., printed in Polish. Nakladem Zakladu Ochrony Przyrody, Krakow, Poland, 1952.

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"The Role of Olfaction in Shark Predation," by Albert L. Tester, article, *Pacific Science*, vol. 17, no. 2, April 1963, printed. University of Hawaii Press, Honolulu, Hawaii.

"Sharks: Attraction by Low-Frequency Sounds," by Donald R. Nelson and Samuel H. Gruber, article, *Science*, vol. 142, no. 3594, November 15, 1963, pp. 975-977, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C., 20005.

SHRIMP:

Descripcion de la Morfologia Externa e Interna del Langostino con Algunas Aplicaciones de Indole Taxonomica y Biologica, *HYMENOPENAEUS MULLERI (Bate)*, Crustacea, Fam. Penaeidae (Description of the External and Internal Morphology of the Shrimp with Some Applications of Taxonomic and Biological Class), by Enrique E. Boschi and Victor Angelescu, 74 pp., illus., printed in Spanish with English summary. Universidad de Buenos Aires, Facultad de Ciencias Exactas y Naturales, Departamento de Biologia, Buenos Aires, Argentina, 1962.

Investigations of Brine Shrimp, by Donald C. Hales, 1 vol., printed, 1957. Utah Fish and Game Department, Salt Lake City, Utah.

La Peche Belge aux Crevettes (The Belgian Shrimp Fishery), by E. Leloup and Ch. Gillis, Special Meeting on Crustacea No. 3, 4 pp., illus., processed in French. International Council for the Exploration of the Sea, Charlottenlund Slot, Denmark, 1962.

Shrimp Landings and Production of the State of Texas for the Period 1956-1959, with a Comparison with Other Gulf States, by Gordon Gunter, 11 pp., illus., printed. (Reprinted from *Publications of the Institute of Marine Science*, vol. 8, 1962, pp. 216-226.) Institute of Marine Science, Port Aransas, Tex.

Studies on Frozen Storage of Prawns, IPFC Occasional Paper 1963/2, printed. Indo-Pacific Fisheries Council, FAO Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand, 1963.

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Les Crevettes Profondes de la Region Atlantique Ibero-Marocaine *Repartition Bathymetrique et Geographi-*

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que, Importance Economique (Deep-Water Shrimps of the Atlantic Ibero-Moroccan Region, Bathymetric and Geographic Distribution and Economic Importance), by Cl. Maurin, Special Meeting on Crustacea No. 8, 4 pp., processed in French.

The Deep-Sea Prawn (PANDALUS BOREALIS) in Ice-landic Waters, by Aóalsteinn Sigrosson and Ingvar Hallgrímsson, Special Meeting on Crustacea No. 28, 11 pp., illus., processed.

Deep-Sea Prawns and the Prawn Fishery in Greenland Waters, by Erik Smidt, Special Meeting on Crustacea No. 1, 5 pp., illus., processed.

Further Results of the German Shrimp Industry, by P. F. Meyer-Waarden and K. Tiewis, Special Meeting on Crustacea No. 35, 13 pp., illus., processed.

Methods to Improve the Yield of the Dutch Shrimp Fisheries, by R. Boddeke, Special Meeting on Crustacea No. 33, 5 pp., processed.

The Pandalus in the Skagerak (Length, Growth and Changes in the Stock and Fishery Yield), by Aage J. C. Jensen, Special Meeting on Crustacea No. 37, 4 pp., illus., processed.

Summary, Dynamics of a Penaeid Shrimp Population and Management Implications, by Joseph H. Kutkuhn, Special Meeting on Crustacea No. 14, 5 pp., illus., processed.

SHRIMP FARMING:

"Problems of Sea Farming Aren't All Technical," by S. F. Manning, article, National Fisherman/Maine Coast Fisherman, vol. 44, April 1963, pp. 22-23, printed. Journal Publishing Co., Belfast, Me.

SMALL BUSINESS MANAGEMENT:

Analyzing Food Brokers' Costs and Margins, by Frank Johnson, Management Research Summary, 2 pp., processed. Small Business Administration, Washington, D. C. 20416, 1963. Food brokers selling a variety of products averaged a higher commission rate than those specializing in sales of a single commodity. Salaries and auto and travel costs accounted for more than 80 percent of brokers' expenses. Mergers and acquisitions have been occurring at increasingly rapid rates.

Counseling Affiliated Food Retailers; a Manual for Food Wholesalers, by Robert L. Bull, no. 31, 220 pp., \$5. Food Distribution Section, University of Delaware, Newark, Del., 1963.

The Effect of Tight Money on Small Business Financing, by Deane Carson, Management Research Summary, 2 pp., processed. Small Business Administration, Washington, D. C. 20416, 1963. When money is tight, discrimination against small firms in the bank-loan market may take two forms. Banks may reduce the flow of loanable funds to small firms in order to maintain or expand the flow to larger firms. Or they may raise interest rates proportionately more on small-business than on large-business loans.

Factors in Small Business Success or Failure, by Edward J. Chambers and Raymond L. Gold, Man-

agement Research Summary, 4 pp., processed. Small Business Administration, Washington, D. C. 20416, 1963. The businessmen taking part in the study generally agreed that success in a small business is likely to come to the man who has the following traits: he works long, hard hours; he has the ability to recover quickly and press on in the face of a setback; he is competitive in attitudes and actions; he is willing to take a minimal profit from his business until he achieves a firm financial position; and he masters the technical and social skills his operation require. The data suggest that there is a "take-off" or a "slide" point in a businessman's career beyond which cumulative experience of success or failure affects his motivation.

Financial Planning in Closely Held Businesses, by Joseph J. Geraci, Management Aid for Small Manufacturers No. 156, 4 pp., processed. Small Business Administration, Washington, D. C. 20416, September 1963. Financial planning can give a closely held company two things: (1) daily operating strength or business nutrition, and (2) business continuation--an existence when the owner-manager is no longer in the business through retirement, death, or some other reason. This report discusses why these two elements are especially needed in closely held firms. It describes pitfalls which such companies must avoid and outlines what should be included in their financial planning.

Food Brokers' Sales and Merchandising Programs, by Frank Johnson and Robert Bull, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington, D. C. 20416. One of a series dealing with the activities of food brokers in the United States. Discusses: (1) agreements between brokers and the manufacturers they represent (called principals); (2) basic operating relations; (3) sales management programs; and (4) brokers' retail merchandising activities.

How Small Firms Handle Their Legal Problems, by Sumner Marcus and Edward J. Chambers, Management Research Summary, 2 pp., processed. Small Business Administration, Washington, D. C. 20416. The manager of a small business, according to the report, should consider carefully whether his firm would benefit from the following practices: (1) periodic consultation with his lawyer to determine whether legal considerations dictate changes in any of the firm's practices; (2) an arrangement with his lawyer that would ensure his awareness of legal problems; and (3) limitation of his dependence on nonlegal advisors to matters that are clearly within their areas of specialization and that do not call for advice they are not qualified to give.

Improving Office Procedures in Food Brokers' Firms, by Daniel J. Bartz, Management Research Summary, 2 pp., processed. Small Business Administration, Washington, D. C., 20416. Work simplification is increasingly important to food brokers because of (1) the need to allocate more time to retail merchandising and sales management, and (2) the many records and reports required for company use and for compliance with Government regulations. The five steps in work simplification are: select the job to be improved; get the facts; challenge every job detail; find a better way to do the job; and install the new method.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Management Counseling of Small Business, by Karl Morrison, Management Research Summary, 2 pp., processed. Small Business Administration, Washington, D. C. 20416, 1963. Findings showed that management counseling can improve the effectiveness of small businesses; while several sources of such counsel are available, no great use is made of them; and some of the barriers to the use of management counsel are deeply imbedded in the very nature of these small firms. It was suggested that a method should be developed for certifying management consultants, similar perhaps to that for public accountants; and small businessmen with identical problems should jointly employ consultants to provide specific services.

Management Counseling of Small Manufacturing Firms, by C. F. Dunham, W. E. Green and R. S. Downer, Management Research Summary, 2 pp., processed. Small Business Administration, Washington, D. C. 20416, 1963. The need for counseling involves such areas as: (1) adaptation of the available production facilities to more efficient operations; (2) motion and methods analysis and plant layout studies; (3) design of special equipment; and (4) advice on market analysis, advertising campaigns, sales promotion, sales forecasting, methods of selecting and training salesmen and other personnel, compensation plans, and selection of distributors. The type of counseling most needed, however, is that based on a thorough analysis of each firm's over-all situation--an analysis that will locate and define the real problem areas.

U. S. Small Business and the Latin American Market, by Carl H. Madden, Management Research Summary, 2 pp., processed. Small Business Administration, Washington, D. C. 20416, 1963. The most pressing need of small United States firms dealing with the Latin American market is for more services such as market information; overseas contacts; tariff, shipping, and other technical export and import information; data on pricing and quality of products; and translation of literature and correspondence. Many small businesses need information and help in learning how to analyze foreign markets intelligently, how to sell in those markets, how to ship and document their goods, and how to collect their money. The need can be met in part by cooperative effort and private organization of export activities. But where such efforts do not meet the need, its importance justifies newly planned Government services.

SMELT:

A Revision of the Smelt Family, OSMERIDAE, by D. E. McAllister, Bulletin No. 191, 53 pp., printed. National Museum of Canada, Ottawa, Canada, 1963.

SOUTH AFRICA REPUBLIC:

Netting Profits--Special Survey of the Inshore Fishing Industry, Supplement to the Financial Mail, June 21, 1963, 51 pp., illus., printed. Financial Mail, Johannesburg, South Africa Republic. A comprehensive survey of the expanding inshore fishing industry of South Africa and South West Africa. Covers markets, production, leading companies and personalities. The industry's chief problems are given as reliance on too narrow a base (mainly pilchards

and spiny lobsters), inadequate fishing harbors, and strong Russian and Japanese competition.

SPAIN:

"En 1962 Excedio Tambien Nuestra Pesca el Millon de Toneladas" (In 1962 Our Fishery Again Exceeded One Million Tons), article, Boletin de Informacion, no. 58, July 1963, pp. 8-16, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6^a Planta, Madrid, Spain. Presents statistical tables giving data on landings by the Biscayan fleet in Sierra Leone waters, quantity and value of national fishery landings, landings by species, landings of cod, landings by freezer vessels, and landings by coastal fishermen and on the high seas by provinces. Also presents data on tuna landings, landings of the principal fishery provinces, destination of landings by coastal fishermen and from the high seas, average prices of some species in 1962 and differences in value and quantity with the preceding year, and provincial fishery imports by species.

"Presente e Futuro da Industria Conserveira Galega" (Present and Future of the Galician Canning Industry), by Francisco Lopez Gapont, article, Conservas de Peixe, vol. XVII, no. 208, July 1963, pp. 20-22, printed in Portuguese. Sociedade da Revista Conservas de Peixe, Lda., Regueirao dos Anjos, 68, Lisbon, Portugal.

SPINY LOBSTERS:

Essais de Peche a la Langouste sur les Bancs et le Plateau Continentale de l'Amérique Tropicale (Experimental Fishing for Spiny Lobsters on the Banks and the Continental Shelf of Tropical America), by R. Letaconneux, Special Meeting on Crustacea No. 9, 2 pp., processed in French. International Council for the Exploration of the Sea, Charlottenlund Slot, Denmark, 1962.

SPOILAGE:

Spoilage of Fish and Crustaceans, Rapid Determination of Volatile Ammonia by Accelerated Microdiffusion, by W. Vyncke and E. Merlevede, 14 pp., illus., printed in English with Dutch, French, and German summaries. (Reprinted from Archives Belges de Medecine Sociale, Hygiene, Medecine du Travail et Medecine Legale, no. 3, March 1963, pp. 147-160.) Laboratory of Industrial Hygiene, University of Ghent, Ghent, Belgium. A simple method for measuring volatile ammonia in fish and crustacea as an index of spoilage is described. It is based on the separation of ammonia by accelerated microdiffusion followed by spectrophotometrical measurement of the color produced with Nessler regent. Four series of experiments with crustacea are added to demonstrate the possibilities of this method. Results show that volatile ammonia correlates well with total volatile bases (TVB), trimethylamine (TMA), and sensory test. It gives the same information about spoilage as TVB and TMA and is valuable especially when used for comparative experiments, and the study of preservatives such as benzoic acid and sodium chloride. Speed, simplicity, and a minimum of materials and products are the great advantages of this microdiffusion method.

SQUID:

Observations on Bioluminescence in Ommastrephes pteropus (Steenstrup, 1855), with Notes on Its Occur-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

rence in the Family Ommastrephidae (Mollusca: Cephalopoda)," by Clyde F. E. Roper, Contribution No. 476, 11 pp., illus., printed in English with Spanish summary. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 13, no. 2, June 1963, pp. 343-353.) The Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

SWEDEN:

"Aktuella Ekonomiska Problem inom Fisket" (Actual Economic Problems in the Fishery), by Ingemar Gerhard, article, Svenska Vastkust Fiskaren, vol. 33, no. 13-14, July 15, 1963, pp. 336-337, printed in Swedish. Svenska Vastkustfiskarnas Centralforbund, Goteborg, Sweden.

"Fisket Ar 1962 Gav Hygglig Inkomst men Blev ett Odeasar for Raktralarare" (The 1962 Year of Fishing Did Not Yield Too Bad an Income but it Was a Fatal Year for Shrimp Trawling), article, Svenska Vastkust Fiskaren, vol. 33, no. 13-14, July 15, 1963, pp. 328-334, illus., printed in Swedish. Svenska Vastkustfiskarnas Centralforbund, Goteborg, Sweden.

SYMBIOSIS:

"Symbiosis: On the Role of Algae Symbiotic with Hydra," by Leonard Muscatine and Howard M. Lenhoff, article, Science, vol. 142, no. 3594, November 15, 1963, pp. 956-958, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

TARIFFS:

Seventh Supplemental Report, Tariff Classification Study, 11 pp., processed. Secretary, United States Tariff Commission, Washington 25, D. C., August 14, 1963. The seventh supplemental report sets forth changes made by the Commission in certain provisions of the Tariff Schedules of the United States identified in the Commission's public notice of July 11, 1963 (28 F. R. 7239). The report also contains an explanation of such changes and an appendix which includes written views and oral testimony received by the Commission. No fishery or fishery allied items included.

TRANSPORTATION:

"Conditions d'Emploi de l'Avion pour le Transport des Denrees Perissables" (Conditions for Use of Aeroplanes for the Transportation of Perishable Foodstuffs), article, Bulletin, Institut International du Froid, vol. 41, no. 1, 1961, pp. 302-308, printed in French with English summary. Institut International du Froid, 177 Boulevard Maiesherbes, Paris XVII, France.

"Railroads Offer Incentive Rates to Induce Frozen Food Freight," article, Quick Frozen Foods, vol. XXVI, no. 1, August 1963, pp. 311-312, printed. E. W. Williams Publications, Inc., 1776 Broadway, New York 19, N. Y.

Study of Rates on Fish and Fishery Products Via Rail, Motor, Water, and Express Including the Development of Applicable Rates and Rate Levels, 57 pp., illus., processed. General Services Administration, Transportation and Communications Service, Washington, D. C. (Available from Transporta-

tion Section, U. S. Bureau of Commercial Fisheries, 400 Wyatt Bldg., Washington, D. C. 20005.) A transportation rate study showing various freight rate systems and individual rate relationships for fishery products. The study is composed of an exhibit divided into four parts plus an explanatory statement. The exhibit shows origin, destination, commodity, transportation tariff commodity description, rates, tariff authority, routing, minimum weights, and type of transportation. Part I covers imports, exports, and cross trade. Part II lists intercoastal steamship, and domestic rail, motor and REA express information. Part III contains the rates and charges applicable from major Alaska ports to Seattle via Alaska Steamship Company, for subsequent movement beyond Seattle by intercoastal carriers. Part IV shows charges assessed by port terminal operators at major United States ports for handling fishery products. The study will be useful for comparing the relationships of transportation costs between competitive points and for determining which companies perform the services and which tariffs are applicable between these points. The rates shown were effective during April, May and June 1962. Individual rates may have changed since then, and for this reason, the study should not be used as a reference for current rates.

TRAWL FISH:

Glossary of Common Trawl Fish, by Howard D. Tait, Informational Leaflet No. 15, 5 pp., processed. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska, 1962.

TRAWLING:

"Hacktralarare, Flyttralar, och Tralsonders" (Stern Trawling, Floating Trawling, and Bottom Trawling), article, Svenska Vastkust Fiskaren, vol. 33, no. 13-14, July 15, 1963, pp. 338-340, illus., printed in Swedish. Svenska Vastkustfiskarnas Centralforbund, Goteborg, Sweden.

"La Peche Industrielle" (Commercial Fishing), by F. Dorville, article, Revue Maritime, no. 183, 1961, pp. 1563-1577, illus., printed in French. Departement des Peches Maritimes, Societe MacGregor-Comarain, Paris, France.

TUNA:

"Observations on the Spawning of Four Species of Tuna (Neothunnus macropterus, Katsuwonus pelamis, Auxis thazard and Euthynnus lineatus) in the Eastern Pacific Ocean, Based on the Distribution of Their Larvae and Juveniles," by Witold L. Klawe, article, Inter-American Tropical Tuna Commission Bulletin, vol. VI, no. 9, 1963, pp. 449-540, illus., printed in Spanish and English. Inter-American Tropical Tuna Commission, La Jolla, Calif.

Synopsis for F. A. O. Species and Stocks Thesaurus of Data on THUNNUS THYNNUS Maccoyii (Castelnau), by J. P. Robins, 36 pp., illus., processed. Commonwealth Scientific and Industrial Research Organization, Division of Fisheries and Oceanography, Cronulla, Australia, 1962.

TURKEY:

Balik ve Balikcilik, vol. XI, no. 8, August 1963, 35 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G. M., Balikcilik Mudur-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATIONS ISSUING THEM.

lugu, Besiktas, Istanbul, Turkey. Includes, among others, articles on: "The Production of Fish Oil Which Are Used in Industry by the Action of Sulphur Compounds;" "Izui Line Hauler in the Marmara Sea," and "The Role of Lights in the Kingdom of Fish and Light Fishing."

UNITED KINGDOM:

Sea Fisheries Statistical Tables, 1962, 48 pp., printed, 5s. (about 70 U.S. cents). Ministry of Agriculture, Fisheries and Food, London, England, 1963. (Available from Her Majesty's Stationery Office, York House, Kingsway, London WC2, England.) For the first time in many years, United Kingdom landings of fresh fish increased and 1962's total of 15,718,000 cwts. was about 804,000 cwts. higher than that in 1961. Wholesale prices, however, dropped and the total value realized in 1962 was £48,862,000 compared with £49,258,000 in the previous year. The value of shellfish continued to rise to £2,461,000. This report consists of statistical tables showing the quantity, value, and average value of fish and shellfish landed in England and Wales by species, region, and method of capture. The different kinds of fish are divided into three main groups: demersal, pelagic, and shellfish. Also includes data on number of fishermen and fishing vessels employed as well as quantity and value of exports and imports, 1961-1962, by kinds and countries.

White Fish Authority, Annual Report and Accounts for the Year Ended 31st March 1963, 59 pp., illus., printed, 3s. 6d. (about 50 U.S. cents). Her Majesty's Stationery Office, York House, Kingsway, London WC2, England, June 14, 1963. Discusses the activities and functions of the White Fish Authority for the fiscal year ending March 31, 1963, its income, expenditures, and fishery loans. Includes sections on production of fishery products; marketing and distribution; research and experiments undertaken; training courses for fishermen; and investigations into the costs and earnings of inshore fishermen. Also includes statistical tables on distribution of trawlers; rebuilding of fleets; interest rates charged by the Authority on loans; a summary of white fish imports; and rates of special subsidy.

U. S. S. R.:

Biology of the Seas of the U. S. S. R., by L. Zenkevitch, 955 pp., illus., printed, \$25, 1963. Interscience Publishers, 440 Park Ave. S., New York 16, N. Y. No country in the world possesses such an abundance and variety of bodies of water as the U. S. S. R. There are in all, 14 seas comprising 5 percent of the total area of the world's water, and their composition ranges from full marine salinity to the brackish. There is an astonishing variety of physiogeographical conditions, which in turn presents a great complexity of flora and fauna, forming a rich subject for scientific investigation. This volume contains a great deal of scientific information, much of it arranged in illustrations, graphs, and tables. It is divided into three areas under headings of The Northern, Southern, and Far Eastern Seas of the U. S. S. R. The Northern Seas are the Barents, White, Kara, Laptev, Chukotsk, and Baltic. The Southern Seas are the Black, Azov, Caspian, and Aral. The Far Eastern Seas are Japan, Okhotsk,

and Bering. In each section the principal aspects of the area are first discussed; general characteristics, zoogeography, hydrological and geological conditions and, where applicable, its commercial productivity. Each sea is then examined in a separate chapter in relation to its particular characteristics, flora and fauna, chemistry, physical geography and geology, and the history of its exploration. Detailed information on the biology and ecology of fish and shellfish species in each sea is included. In addition to its contribution to methodology and approach, the work will prove invaluable as a source of information about areas with which the western biologist has no direct contact.

Management of Fisheries and Dynamics of Fish Populations, USSR, OTS 63-31056, 49 pp., processed, \$1.25. Office of Technical Services, U. S. Department of Commerce, Independence Ave. and Ohio Dr. SW., Washington, D. C. 20235, June 18, 1963.

Most Promising Fishing Regions According to Data of Oceanological Research USSR, by D. Ya. Berenbeym and A. N. Probatov, OTS 63-31089, 10 pp., illus., processed, 50 cents. Office of Technical Services, U. S. Department of Commerce, Independence Ave. and Ohio Dr. SW., Washington, D. C. 20235, June 21, 1963.

Translations from Voprosy Ikhtologii (Problems of Ichthyology), no. 1, 1962, OTS 63-31085, 75 pp., illus., processed, \$2. Office of Technical Services, U. S. Department of Commerce, Independence Ave. and Ohio Dr. SW., Washington, D. C. 20235, June 20, 1963.

VESSELS:

Mechanization of Fishing in Andhra Pradesh, IPFC Occasional Paper 1963/4, printed. Indo-Pacific Fisheries Council, FAO Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand, 1963.

Progress of Mechanization of Fishing Boats in West Pakistan, IPFC Occasional Paper 1963/3, printed. Indo-Pacific Fisheries Council, FAO Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Rd., Bangkok, Thailand, 1963.

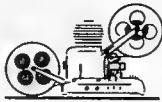
VOCATIONAL TRAINING:

Report on the Educational Program for Fishermen of the Maritime Provinces, 17 pp., printed. Extension Department, St. Francis Xavier University, Antigonish, Nova Scotia, 1963.

System of Professional Training in the Fishery Industry: Lecture No. 7 of the Seminar and Study Tour for Fishery Administration from Indo-Pacific and Mediterranean Regions, September-October 1961, Moscow, 22 pp., printed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Vocational Training and Certificates of Competency, 2 parts, printed. International Labour Organisation, Committee on Conditions of Work in the Fishing Industry, Geneva, Switzerland, 1962.

FISHERY MOTION PICTURE



The following motion picture is available only from the source given in the listing.



Watermen of Chesapeake is a sound-color motion picture on the economic and recreational importance of the Chesapeake Bay and will be available for free showing to the public.

This was announced simultaneously on September 22, 1963, by the U. S. Department of the Interior and the cooperating agencies, the Maryland Department of Tidewater Fisheries, and the Virginia Commission of Fisheries.



A Chesapeake Bay sail-powered oyster dredging vessel. These picturesque vessels have worked the natural beds of Chesapeake Bay for many years.

Chincoteague, Va. There also are visits to Tangier and Smith Islands, where traces of the old English language still remain.

Production of Watermen of Chesapeake was supervised by the Department's Bureau of Commercial Fisheries, Fish and Wildlife Service.

Prints of the 16-millimeter film soon will be available on a free-loan basis at Bureau of Commercial Fisheries film libraries in many parts of the country. Inquiries should be sent to the Bureau of Commercial Fisheries Film Library, U. S. Department of the Interior, Box 128, College Park, Maryland 20740.

The 28-minute film, Watermen of Chesapeake, shows the impact of the Bay and its resources on a large segment of America, from early days to the present.

The picture portrays the activities of fishermen in their harvest of clams, oysters, crab, flounder, and other marine food and shows the importance of the Chesapeake Bay to such sports as duck hunting, water skiing, and boating.

The Department said production of the film was possible only because of the assistance of the Maryland and Virginia fishery agencies.

Highlights of the film include the operation of America's only sail-powered oyster fleet, the widely known crab derby at Crisfield, Md., and the penning and auctioning of the world-famous wild ponies at

COMMERCIAL FISHERIES REVIEW

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ROBERT H. BIRD 19 FEBRUARY 1964

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Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

G. A. Albano, H. M. Bearse, and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, Wyatt Bldg., Suite 611, 777 14th Street, NW., Washington, D. C. 20005.

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5/31/68

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Cover: Photograph is from new industry-financed "Fisheries Marketing Bulletin," Can-venient Ways With Shrimp. This four-color publication was a joint effort of the Bureau of Commercial Fisheries and the Gulf Shrimp Cannery Association. National distribution to food editors and others in the field of communicating with the public was made by Bureau Marketing Specialists before and during Lent. (Cover picture--Upper left: Shrimp De Jonghe; Lower left: Shrimp Chowder; Upper right: Shrimp Macaroni Salad; Lower right: Patio Shrimp Plate; for recipes, see p. 6.)

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UTILIZATION OF U. S. OTTER-TRAWL SHRIMP VESSELS IN THE GULF OF MEXICO, 1959-1961

By Roy L. Lassiter, Jr.*

SUMMARY AND CONCLUSIONS

The study is based on an analysis of the operations of a sample of 1,000 United States otter-trawl shrimp vessels over 15 gross tons in size for each of the years 1959, 1960, and 1961.

There was substantial variation in average landings between and within vessel size classes over the time period studied. Average landings and fishing effort increased with vessel size through the 60- to 69-gross ton class, and the relative variation in productivity and fishing effort among vessels decreased through this same class. However, even within the more productive vessel size classes, such factors as weather, skill and luck of the captain and crew, and the availability of shrimp caused substantial variation in productivity and fishing effort among vessels.

The relatively high correlations between landings and days fished indicate that the "days fished" concept is an adequate measure of fishing effort. Additional fishing days on the average contributed substantially to increased landings. However, again there was considerable variation in results among vessels.

There was substantial seasonal variation in the extent to which shrimp vessels are utilized. Furthermore, this variation was inversely related to vessel size. Typically, a high proportion of the large vessels were active in shrimp fishing throughout the year which in part explains the higher annual average landings by those vessels. A substantial part of the shrimp fleet is underutilized, in the sense that it is inactive during the winter and early months of the year. If suitable alternative vessel uses could be found during those periods of low shrimp availability, the over-all economic productivity of those vessels would be increased. On the other hand, it is apparent that a substantial portion of the fleet is fully utilized in shrimp fishing when time allowance is made for vessel maintenance, running time, crew vacations, and adverse weather conditions. Many of the long-range vessels that fish over wide areas of the Gulf appear to be employed about as fully as could be expected.

BACKGROUND

This paper has as its purpose the presentation of the over-all purpose, procedures, and some of the findings of an extensive statistical analysis and study of shrimp vessels operating in the Gulf of Mexico. Those aspects of the findings of the study dealing with over-all vessel productivity, fishing effort, and seasonality of vessel operations are presented.

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Note: This study was conducted for the U. S. Bureau of Commercial Fisheries under Contract No. 14-17-0007-46 with the Bureau of Economic and Business Research, University of Florida. This paper reports on important aspects of the over-all study. The complete report was published by the Bureau of Economic and Business Research, University of Florida, in the fall of 1963.

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
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OVER-ALL PURPOSE AND PROCEDURES

The basic study attempts to define the extent to which United States shrimp vessels were utilized in the Gulf of Mexico area in 1959, 1960, and 1961. Vessel utilization was measured primarily in terms of pounds of shrimp landed and "days fished," and was examined on an annual and seasonal basis as related to vessel size, controlling port, and area fished. A "day fished" is defined as 24 hours spent in some phase of the actual fishing operation. Vessel size was measured in gross tons. The controlling port is the port with which the vessel is identified for purpose of statistical compilation. The fishing areas are those used by the U. S. Bureau of Commercial Fisheries for statistical and biological research purposes.

The basic data for the study were obtained from a random sample of 1,000 vessels selected from the U. S. Bureau of Commercial Fisheries listing on Machine Run No. 8 for each of the years 1959, 1960, and 1961. This sample size represents about one-third of the total shrimp vessels operating in the Gulf of Mexico in those years. The vessels selected were of 15 gross tons and over in size, and additional data on controlling port was obtained from the "Vessel Code Book" of the U. S. Bureau of Commercial Fisheries. The data from Machine Run No. 8 and that from the "Vessel Code Book" were punched on machine cards and extensive computations were made regarding landings, days fished, area fished, etc., as consistent with the purposes of the study. The findings were supported and validated by an informal field investigation throughout the Gulf area.



A typical Louisiana offshore trawler of about 60 ft. over-all length and 16 net tons.

PRODUCTIVITY AND FISHING EFFORT OF SAMPLE VESSELS, 1959-1961

The landings of the 1,000 sample vessels amounted to 33.4 million pounds in 1959, 39.1 million pounds in 1960, and 27.2 million pounds in 1961 (table 1). In both 1959 and 1960 median^{1/} landings per vessel were greater than the mean^{2/} vessel landings. However, in 1961 this was reversed indicating that more than one-half of the vessels caught less than the arithmetic mean landings. There was considerable variability in landings among the vessels in all three years, with the greatest relative variation occurring in 1961.

The mean and median number of days fished for the 1,000 sample vessels amounted to approximately 45 to 52 days per year over the period. On a relative basis the variation among the sample vessels in terms of days fished, although considerable, was less than that on the basis of landings. The distributions of vessels in terms of days fished were more symmetrical than those when vessels were distributed on the basis of landings.

Landings and fishing effort also varied with vessel size. When the 1,000 vessels were sorted by vessel size, it was evident that average landings and days fished increased with ves-

^{1/}The median means that there are just as many vessels landing more than the median vessel as there are vessels landing less than the median vessel.

^{2/}The arithmetic mean is synonymous with "average," which is obtained by dividing the sum of the landings by the number of vessels.

sel size, at least through the 60- to 69-ton class (table 2). The vessels in the 60- to 69-gross-ton category recorded the highest average landings in 2 out of the 3 years and the highest average days fished in all 3 years. Furthermore, the relative variation in both landings and days fished decreased with vessel size through the 60- to 69-gross-ton category.

The relationship between productivity (as measured by landings) and fishing effort (as measured by days fished) was investigated further by simple linear regression and correlation techniques.^{3/} This analysis revealed a high positive relationship between landings and days fished in each of the three years (table 3). The correlation coefficients and the amount of the variation "explained" by the regression of landings on days fished were somewhat lower for the medium to large vessels than for the very small and very large vessels. While this may seem contradictory to the analysis of mean landings, it primarily is explained in terms of the seasonal patterns of fishing activity by vessel size which is to be discussed in the following section.

The average addition to landings associated with an additional day fished (as measured by the regression coefficients) amounted to 733 pounds in 1959, 766 pounds in 1960, and 617 pounds in 1961. The standard error of the estimate for all size classes and for each year indicated substantial variability in results from additional fishing effort among the vessels.

SEASONALITY OF VESSEL UTILIZATION OF ALL SAMPLE VESSELS

Investigation of the activity of the 1,000 sample vessels on a monthly basis revealed substantial variation in landings and effort throughout each of the years 1959, 1960, and 1961 (table 4). The seasonal patterns were essentially the same in each year except that landings in June, July, August, and September of 1961 did not rise to normal levels because of the failure of brown shrimp to appear in usual quantities in the central and western Gulf. The seasonal low of vessel activity occurs in the months of February, March, and

April when approximately only 50 to 60 percent of the vessels are active. Vessel activity increases from the low months to a peak in July and August and then gradually declines throughout the remainder of the year. Mean landings and days fished tend to follow the same pattern. The pattern of mean days fished per trip is inverse to that just described in that the lowest

^{3/}Regression techniques show the functional relationship between two variables. In the case of this study it gives an expected change in productivity for a given change in fishing effort. Correlation techniques measure the proportion of the variations in the dependent variable (productivity) accounted for by variations in the independent variable (effort).

Table 1 - Number of Sample United States Otter-Trawl Shrimp Vessels Fishing the Gulf of Mexico Area Classified by Landings and Days Fished, 1959-1961

| | 1961 | 1960 | 1959 |
|---|-------------------------------------|----------|----------|
| Landings | .. (Number of Vessels Reporting) .. | | |
| 1,000 Lbs. | | | |
| 10.9 and under | 191 | 119 | 154 |
| 11.0 to 20.9 | 226 | 122 | 125 |
| 21.0 to 30.9 | 196 | 133 | 173 |
| 31.0 to 40.9 | 148 | 159 | 189 |
| 41.0 to 50.9 | 142 | 165 | 183 |
| 51.0 to 60.9 | 68 | 135 | 107 |
| 61.0 to 70.9 | 23 | 101 | 51 |
| 71.0 to 80.9 | 2 | 47 | 17 |
| 81.0 to 90.9 | 2 | 9 | 3 |
| 91.0 and over | 2 | 13 | 2 |
| Total vessels | 1,000 | 1,003 | 1,004 |
| Total landings | (1,000 Lbs.) | | |
| Mean: | 27,218.4 | 39,053.9 | 33,388.6 |
| Landings per vessel | 27.2 | 38.9 | 33.3 |
| Median: | 25.2 | 39.0 | 33.6 |
| Standard deviation of: | | | |
| Landings | 17.0 | 21.5 | 18.6 |
| Coefficient of variation of: Landings | (Percent) | | |
| | 62.4 | 55.3 | 56.1 |
| Days Fished | .. (Number of Vessels Reporting) .. | | |
| 1,000 Lbs. | | | |
| 10.9 and under | 67 | 88 | 95 |
| 11.0 to 20.9 | 91 | 55 | 78 |
| 21.0 to 30.9 | 103 | 100 | 106 |
| 31.0 to 40.9 | 128 | 123 | 156 |
| 41.0 to 50.9 | 119 | 118 | 153 |
| 51.0 to 60.9 | 125 | 151 | 133 |
| 61.0 to 70.9 | 144 | 122 | 110 |
| 71.0 to 80.9 | 97 | 98 | 99 |
| 81.0 to 90.9 | 77 | 78 | 53 |
| 91.0 and over | 49 | 70 | 21 |
| Total vessels | 1,000 | 1,003 | 1,004 |
| Total days fished | (Number) | | |
| Mean: | 49,595.4 | 51,238.7 | 45,984.5 |
| Days fished per vessel | 49.6 | 51.1 | 45.8 |
| Median: | 50.9 | 52.2 | 45.4 |
| Standard deviation of: | | | |
| Days fished | 25.1 | 25.8 | 23.7 |
| Coefficient of variation of: Days fished | (Percent) | | |
| | 50.6 | 50.5 | 51.7 |
| Note: Source--Data in tables 1-4 were compiled from U. S. Bureau of Commercial Fisheries Machine Run No. 8. Landings in thousands of pounds and days fished in number of days. Four additional vessels in 1959 and three additional vessels in 1960 were inadvertently included in the tabulations. These were left in because of the difficulty of extricating the landings and effort of these vessels and further because with such a large sample size they will have little impact on the results. | | | |

Table 2 - Means, Medians, Standard Deviations, and Coefficients of Variation of Landings and Days Fished of Sample Vessels in the Gulf of Mexico Area, Classified by Vessel Size, 1959-1961

| Vessel Size in Gross Tons | Mean Landings and Days Fished | | | Median Landings and Days Fished | | | Standard Deviation of Landings and Days Fished | | | Coefficient of Variation of Landings and Days Fished | | | |
|---------------------------------|-------------------------------------|------|------|---------------------------------------|------|------|--|------|------|--|------|------|------|
| | 1961 | 1960 | 1959 | 1961 | 1960 | 1959 | 1961 | 1960 | 1959 | 1961 | 1960 | 1959 | |
| 15 to 29: | | | | | | | | | | | | | |
| Landings (1,000 lbs.) | 12.3 | 21.9 | 20.5 | 11.2 | 21.2 | 20.3 | 8.7 | 12.6 | 13.4 | Percent | 70.9 | 57.6 | 65.4 |
| Days fished (no.) | 28.3 | 30.4 | 28.9 | 26.6 | 30.7 | 29.5 | 17.5 | 17.7 | 17.2 | Days | 61.8 | 58.2 | 59.5 |
| 30 to 39: | | | | | | | | | | | | | |
| Landings (1,000 lbs.) | 20.8 | 33.6 | 26.5 | 18.9 | 32.4 | 26.9 | 13.3 | 17.8 | 15.4 | Percent | 63.8 | 52.9 | 58.0 |
| Days fished (no.) | 40.6 | 44.8 | 37.4 | 39.3 | 45.2 | 38.1 | 20.9 | 20.7 | 19.4 | Days | 51.5 | 46.2 | 51.9 |
| 40 to 49: | | | | | | | | | | | | | |
| Landings (1,000 lbs.) | 26.0 | 39.9 | 32.8 | 24.1 | 39.0 | 33.5 | 14.5 | 21.0 | 16.6 | Percent | 55.9 | 52.7 | 50.5 |
| Days fished (no.) | 48.3 | 50.4 | 45.6 | 49.8 | 52.8 | 45.4 | 22.4 | 23.4 | 21.0 | Days | 46.4 | 46.4 | 46.1 |
| 50 to 59: | | | | | | | | | | | | | |
| Landings (1,000 lbs.) | 31.0 | 45.2 | 38.3 | 30.3 | 47.2 | 38.9 | 13.9 | 19.3 | 16.5 | Percent | 44.9 | 42.7 | 43.1 |
| Days fished (no.) | 56.7 | 59.2 | 52.5 | 58.4 | 62.1 | 55.3 | 22.6 | 22.5 | 20.6 | Days | 39.9 | 38.0 | 39.2 |
| 60 to 69: | | | | | | | | | | | | | |
| Landings (1,000 lbs.) | 41.4 | 53.3 | 47.7 | 42.2 | 54.8 | 48.1 | 14.4 | 19.0 | 14.8 | Percent | 34.9 | 35.8 | 31.0 |
| Days fished (no.) | 69.2 | 70.1 | 65.8 | 71.4 | 74.0 | 68.6 | 18.1 | 23.0 | 20.2 | Days | 26.2 | 32.8 | 30.7 |
| 70 to 79: | | | | | | | | | | | | | |
| Landings (1,000 lbs.) | 42.8 | 49.8 | 47.1 | 43.7 | 52.7 | 48.4 | 14.6 | 19.3 | 19.7 | Percent | 34.0 | 38.8 | 41.7 |
| Days fished (no.) | 69.0 | 62.9 | 59.7 | 71.0 | 67.5 | 65.3 | 18.8 | 23.5 | 20.5 | Days | 27.2 | 37.4 | 34.3 |
| 80 and over: | | | | | | | | | | | | | |
| Landings (1,000 lbs.) | 33.3 | 42.0 | 40.4 | 33.0 | 43.0 | 41.0 | 16.5 | 26.9 | 23.8 | Percent | 49.6 | 64.0 | 59.0 |
| Days fished (no.) | 58.0 | 52.8 | 51.1 | 63.5 | 55.0 | 48.5 | 24.9 | 31.7 | 26.0 | Days | 42.9 | 60.0 | 50.9 |

Note: See table 1 for explanation of source data.

average days fished per trip occur in the months of peak landings and fishing activity. This is the result of large quantities of shrimp being available close to the mainland in the central and western Gulf areas. In the early months of the year a substantial portion of the shrimp fishing activity is located off the Mexican coast and the average days fished per trip is higher.

SEASONALITY OF VESSEL UTILIZATION BY VESSEL SIZE

It would be suspected that weather conditions and the location of shrimp in the winter months would affect the seasonality of vessel use in the various size categories, as was the case. Typically the proportion of smaller vessels active in the early months of the year was small while a higher proportion of the medium to large vessels remained active throughout the year. Only 25 to 30 percent of the vessels in the 15- to 29-gross-ton class were active during February and March as contrasted to over 55 percent active vessels in the 60- to 69-

Table 3 - Correlation Coefficients, Coefficients of Determination, Y Intercept Values, Regression Coefficients, and Standard Error of Estimates of Correlations Between Landings and Days Fished for Sample Otter Trawl Shrimp Vessels in the Gulf of Mexico Area, Classified by Vessel Size, 1959-1961

| Vessel Size in Gross Tons | Correlation Coefficient | | | Coefficient of Determination | | | Y Intercept Values | | |
|------------------------------|-------------------------|--------|--------|------------------------------|-----------|----------|--------------------|-----------|-----------|
| | 1961 | 1960 | 1959 | 1961 | 1960 | 1959 | 1961 | 1960 | 1959 |
| 15 to 29 | 0.90 | 0.91 | 0.93 | 0.81 | 0.83 | 0.86 | - 805.13 | - 56.18 | - 241.94 |
| 30 to 39 | 0.88 | 0.90 | 0.93 | 0.77 | 0.81 | 0.86 | -1,958.79 | -2,024.30 | -1,793.99 |
| 40 to 49 | 0.87 | 0.89 | 0.92 | 0.76 | 0.79 | 0.85 | - 491.39 | - 46.12 | - 994.20 |
| 50 to 59 | 0.87 | 0.89 | 0.90 | 0.76 | 0.79 | 0.81 | 603.18 | 962.15 | 40.76 |
| 60 to 69 | 0.85 | 0.89 | 0.81 | 0.72 | 0.79 | 0.66 | -3,557.59 | 2,304.06 | 9,128.68 |
| 70 to 79 | 0.90 | 0.81 | 0.92 | 0.81 | 0.66 | 0.85 | -3,543.26 | 7,908.36 | -4,511.17 |
| 80 and over | 0.93 | 0.97 | 0.92 | 0.86 | 0.94 | 0.85 | -3,204.43 | -1,609.76 | -3,816.50 |
| All sample vessels | 0.92 | 0.92 | 0.93 | 0.85 | 0.86 | 0.92 | -3,398.12 | - 203.91 | - 327.72 |
| Vessel Size in Gross Tons | Regression Coefficients | | | Standard Error of Estimates | | | | | |
| | 1961 | 1960 | 1959 | 1961 | 1960 | 1959 | | | |
| 15 to 29 | 463.64 | 722.86 | 718.07 | 3,889.22 | 5,738.25 | 4,986.61 | | | |
| 30 to 39 | 560.14 | 794.22 | 756.06 | 6,235.22 | 8,126.44 | 5,951.77 | | | |
| 40 to 49 | 548.88 | 792.26 | 741.56 | 7,265.86 | 9,892.74 | 6,684.49 | | | |
| 50 to 59 | 535.50 | 747.56 | 727.49 | 6,875.45 | 9,306.06 | 7,201.02 | | | |
| 60 to 69 | 649.22 | 726.59 | 586.80 | 7,502.83 | 8,670.31 | 8,442.36 | | | |
| 70 to 79 | 671.65 | 665.84 | 864.72 | 6,164.24 | 11,623.21 | 7,799.04 | | | |
| 80 and over | 628.81 | 826.98 | 864.47 | 5,876.87 | 6,287.73 | 9,764.36 | | | |
| All sample vessels | 617.33 | 766.19 | 733.24 | 6,808.47 | 8,603.53 | 7,084.56 | | | |

Note: See table 1 for explanation of source data.

gross-ton category. The highest proportion of vessels active for all vessel size classes was recorded in July through October.

The mean landings per active vessel by size class behaved in essentially the same manner as the proportion of vessels active. The mean landings per month of the vessels in the 60- to 69-gross-ton class were higher than those of the other size classes except in July and September when the vessels of 80 gross tons and over averaged higher landings. There were substantial differences in mean landings per active vessel between vessel size classes and substantial ranges in mean landings per active vessel within size classes over the year. Peak landings for all vessel size classes occurred in the months of June through October.

Table 4 - Number of All Sample Vessels in the Gulf of Mexico Area Reporting Activity and the Average Effort and Productivity by Month, 1959-1961

| Month and Year | Vessels Reporting Activity | Mean Landings Per Vessel | Mean Days Fished Per Vessel | Mean Trips Per Vessel | Mean Landings Per Day Fished | Mean Landings Per Trip | Mean Days Fished Per Trip |
|-------------------|----------------------------|--------------------------|-----------------------------|-----------------------|------------------------------|------------------------|---------------------------|
| | No. | Lbs. | No. | No. | Lbs. | Lbs. | No. |
| January: | | | | | | | |
| 1961 . . . | 604 | 3,076 | 5.0 | 2.3 | 617 | 1,353 | 2.2 |
| 1960 . . . | 604 | 2,831 | 4.8 | 2.2 | 585 | 1,307 | 2.2 |
| 1959 . . . | 640 | 1,997 | 4.3 | 2.2 | 462 | 891 | 1.9 |
| February: | | | | | | | |
| 1961 . . . | 577 | 2,770 | 5.2 | 2.2 | 535 | 1,261 | 2.4 |
| 1960 . . . | 578 | 2,424 | 4.5 | 2.0 | 540 | 1,202 | 2.2 |
| 1959 . . . | 564 | 1,891 | 4.9 | 1.9 | 382 | 986 | 2.6 |
| March: | | | | | | | |
| 1961 . . . | 576 | 3,107 | 6.1 | 2.7 | 511 | 1,169 | 2.3 |
| 1960 . . . | 506 | 2,963 | 5.3 | 2.2 | 558 | 1,337 | 2.4 |
| 1959 . . . | 537 | 1,815 | 5.5 | 2.5 | 332 | 730 | 2.2 |
| April: | | | | | | | |
| 1961 . . . | 568 | 2,293 | 5.0 | 2.5 | 462 | 900 | 1.9 |
| 1960 . . . | 617 | 3,004 | 5.4 | 2.4 | 553 | 1,271 | 2.3 |
| 1959 . . . | 588 | 1,857 | 5.0 | 2.3 | 374 | 820 | 2.2 |
| May: | | | | | | | |
| 1961 . . . | 651 | 2,236 | 5.5 | 2.6 | 404 | 860 | 2.1 |
| 1960 . . . | 662 | 2,534 | 5.7 | 2.4 | 448 | 1,058 | 2.4 |
| 1959 . . . | 684 | 2,084 | 5.5 | 2.4 | 380 | 870 | 2.3 |
| June: | | | | | | | |
| 1961 . . . | 803 | 2,905 | 6.2 | 2.8 | 469 | 1,032 | 2.2 |
| 1960 . . . | 766 | 3,490 | 6.3 | 2.7 | 555 | 1,293 | 2.3 |
| 1959 . . . | 729 | 4,009 | 5.6 | 2.7 | 721 | 1,472 | 2.0 |
| July: | | | | | | | |
| 1961 . . . | 864 | 3,808 | 6.9 | 3.3 | 550 | 1,156 | 2.1 |
| 1960 . . . | 826 | 7,962 | 7.2 | 3.9 | 1,110 | 2,044 | 1.8 |
| 1959 . . . | 764 | 6,477 | 6.3 | 3.3 | 1,026 | 1,991 | 1.9 |
| August: | | | | | | | |
| 1961 . . . | 853 | 3,897 | 7.3 | 3.1 | 532 | 1,274 | 2.4 |
| 1960 . . . | 838 | 6,735 | 6.9 | 3.6 | 982 | 1,881 | 1.9 |
| 1959 . . . | 795 | 6,066 | 6.1 | 3.3 | 992 | 1,857 | 1.9 |
| September: | | | | | | | |
| 1961 . . . | 770 | 3,162 | 4.6 | 2.5 | 681 | 1,284 | 1.9 |
| 1960 . . . | 809 | 5,876 | 6.7 | 3.4 | 868 | 1,745 | 2.0 |
| 1959 . . . | 785 | 5,992 | 6.3 | 3.2 | 951 | 1,867 | 2.0 |
| October: | | | | | | | |
| 1961 . . . | 743 | 4,127 | 6.6 | 3.2 | 623 | 1,276 | 2.0 |
| 1960 . . . | 826 | 6,501 | 7.0 | 3.4 | 935 | 1,912 | 2.0 |
| 1959 . . . | 782 | 5,761 | 6.2 | 3.1 | 932 | 1,850 | 2.0 |
| November: | | | | | | | |
| 1961 . . . | 677 | 3,333 | 5.3 | 2.7 | 626 | 1,248 | 2.0 |
| 1960 . . . | 817 | 4,511 | 6.1 | 2.8 | 740 | 1,639 | 2.2 |
| 1959 . . . | 735 | 3,671 | 4.6 | 2.6 | 796 | 1,437 | 1.8 |
| December: | | | | | | | |
| 1961 . . . | 676 | 3,381 | 5.8 | 2.1 | 578 | 1,585 | 2.7 |
| 1960 . . . | 679 | 2,981 | 4.7 | 2.1 | 641 | 1,431 | 2.2 |
| 1959 . . . | 690 | 3,650 | 4.9 | 2.5 | 742 | 1,469 | 2.0 |

Note: See table 1 for explanation of source data.

In terms of mean days fished by active vessels, the vessels in the 60- to 69-gross-ton class were consistently higher than the vessels in the other size classes. The seasonal pattern was less well defined by this measure of vessel utilization, although for the smaller vessel size classes it was still well defined. Seasonality was well pronounced in terms of mean

landings per day fished for all vessel size categories, but the advantage of vessel size was less apparent.

Mean landings per fishing trip and mean days fished per trip by vessel size class clearly indicated differences associated with vessel size. The fishing trips of the larger vessels were longer and landings were greater. The vessels in the 60- to 69-gross ton class caught more shrimp per trip and made longer trips than the vessels in the other size classes. Further investigation revealed that the vessels in this size class were those which ranged the greatest distance over the Gulf of Mexico fishing the Campeche-Obregon area in the winter and spring, moving off the Texas coast in the summer and early fall, and then returning to Campeche.



SHRIMP RECIPES

SHRIMP DE JONGHE

| | |
|--|---|
| 4 cans ($4\frac{1}{2}$ or 5 ounces each) shrimp | $\frac{1}{4}$ teaspoon crushed garlic |
| $\frac{3}{4}$ cup toasted dry bread crumbs | $\frac{1}{4}$ teaspoon nutmeg |
| $\frac{1}{4}$ cup chopped green onions and tops | $\frac{1}{4}$ teaspoon salt |
| $\frac{1}{4}$ cup chopped parsley | Dash pepper |
| $\frac{3}{4}$ teaspoon crushed tarragon | $\frac{1}{2}$ cup butter or margarine, melted |
| | $\frac{1}{4}$ cup sherry |

Drain shrimp. Cover shrimp with ice water and let stand for 5 minutes; drain. Combine crumbs, onion, parsley, and seasonings. Add butter and sherry; mix thoroughly. Combine crumb mixture and shrimp; toss lightly. Place in a well-greased, shallow 1-quart casserole. Bake in a hot oven, 400° F., for 15 to 20 minutes or until lightly browned. Serves 6.

SHRIMP MACARONI SALAD

| | |
|---|--------------------------------------|
| 3 cans ($4\frac{1}{2}$ or 5 ounces each) shrimp | 3 tablespoons garlic French dressing |
| 2 cups cooked shell macaroni | 1 tablespoon lemon juice |
| 1 cup chopped raw cauliflower | 1 teaspoon grated onion |
| 1 cup sliced celery | 1 teaspoon celery seed |
| $\frac{1}{4}$ cup chopped parsley | 1 teaspoon salt |
| $\frac{1}{4}$ cup chopped sweet pickle or drained pickle relish | $\frac{1}{4}$ teaspoon pepper |
| $\frac{1}{2}$ cup mayonnaise or salad dressing | Salad greens |
| | 1 hard-cooked egg, sliced |

Drain shrimp. Cover shrimp with ice water and let stand for 5 minutes; drain. Cut large shrimp in half. Combine macaroni, cauliflower, celery, parsley, pickle, and shrimp. Combine mayonnaise, French dressing, lemon juice, onion, and seasonings; mix thoroughly. Add mayonnaise mixture to shrimp mixture and toss lightly; chill. Serve on salad greens. Garnish with egg slices. Serves 6.

SHRIMP CHOWDER

| | |
|--|-----------------------------|
| 3 cans ($4\frac{1}{2}$ or 5 ounces each) shrimp | 1 cup diced potatoes |
| $\frac{1}{4}$ cup chopped onion | $\frac{1}{2}$ teaspoon salt |
| 2 tablespoons melted fat or oil | Dash pepper |
| 1 cup boiling water | 2 cups milk |
| | Chopped parsley |

Drain shrimp and rinse with cold water. Cut large shrimp in half. Cook onion in fat until tender. Add boiling water, potatoes, and seasonings. Cover and cook for 15 minutes or until potatoes are tender. Add milk and shrimp; heat. Garnish with parsley. Serves 6.

PATIO SHRIMP PLATE

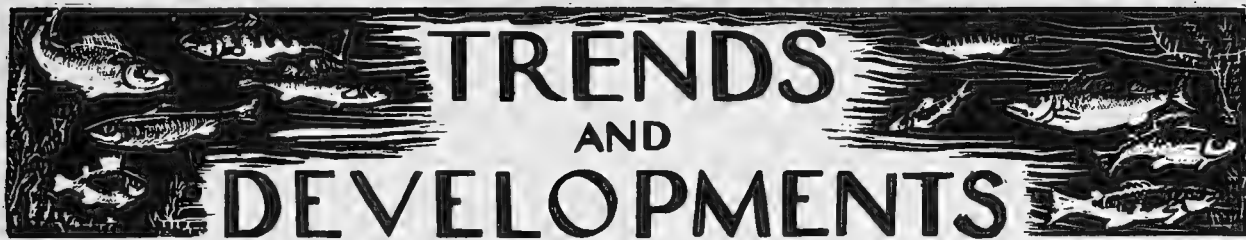
| | |
|--|--------------------|
| 3 cans ($4\frac{1}{2}$ or 5 ounces each) shrimp | Lettuce |
| 1 large cucumber, sliced | Patio Shrimp Sauce |

Drain shrimp. Cover shrimp with ice water and let stand for 5 minutes; drain. Arrange shrimp and cucumber slices on lettuce. Serve with Patio Shrimp Sauce. Serves 6.

PATIO SHRIMP SAUCE

| | |
|---------------------------|--------------------------------|
| 1 cup sour cream | $\frac{1}{2}$ teaspoon paprika |
| 1 tablespoon horseradish | $\frac{1}{2}$ teaspoon salt |
| 1 tablespoon grated onion | |

Combine all ingredients and blend well.



TRENDS AND DEVELOPMENTS

Alaska

MAJOR CHANGES IN COMMERCIAL FISHING REGULATIONS FOR 1964:

Major changes in Alaska's commercial fisheries regulations for 1964, which were adopted by the Board of Fish and Game at Ketchikan in December 1963, were as follows:

The definition of long-line gear was amended to include the type which can be used for fishing salmon. This change coupled with an amendment to the International Water Area section prohibits United States nationals taking salmon by both net or long-line gear in International Waters. This action is being taken by all Pacific Coast States as well as Canada to prevent the possibility of such a high-seas fishery becoming established.

Under the General Provisions section, applicable to all Alaska waters or designated areas, the use of mechanical clam diggers is permitted in the Kodiak, Chignik, Alaska Peninsula, and Aleutian Islands areas.

A further amendment to this section prohibits aliens not lawfully admitted to the United States from engaging in fishing activities in waters of the State of Alaska.

Under the International Waters section, the species and covered waters was broadened to include tanner and dungeness crab besides king crab, and the area was increased to include any waters seaward of that officially designated as the territorial waters of Alaska to a depth of 200 meters, or beyond that limit, to where the depth of the superjacent waters admits of the exploitation of these crabs. This action, expanding the covered International Waters from only those seaward of Cook Inlet and Kodiak, was taken by the Board to assert and demonstrate Alaska's interest in the conservation of the resources of the continental shelf as outlined in the 1958 Geneva Conference on the Law of the Sea. Regulations promulgated by the Board for these species in Cook Inlet and Kodiak will apply in the Inter-

national Waters previously described in the regulations for these areas.

Arctic-Yukon-Kuskokwim Area: Subdistrict No. 3 of the Yukon River, which is located from Owl Slough near Marshall upstream to the mouth of the Koyukuk River, will be open to commercial fishing 6:00 p.m. Monday to 6:00 p.m. Friday, four days a week, until the quota of 3,000 king salmon is taken. Commercial fishermen fishing this subdistrict cannot transfer and fish in subdistricts No. 1 and No. 2 at a later date.

Commercial fishing for king salmon in subdistrict No. 1 of the Kuskokwim River is open two days a week, 6:00 p.m. Monday to 6:00 p.m. Tuesday and from 6:00 p.m. Friday to 6:00 p.m. Saturday. It was the Board's decision that the king salmon run in this subdistrict should be managed by a weekly fishing period which can be adjusted according to the abundance of fish, rather than on a quota basis. Also, commercial fishing in subdistrict No. 1 of the Kuskokwim River will be allowed four days a week after August 1.

Those persons licensed to fish commercially in Norton Sound, with the exception of subdistrict No. 1, and the Kotzebue district, shall not be allowed to subsistence fish for six hours before each commercial fishing period. The intent of this regulation is to limit the illegal selling of fish, reduce fish wastage, and still allow commercial fishermen to take sufficient quantities of salmon for subsistence.

A permit will be required for all subsistence fishermen fishing in the Tanana drainage above the mouth of the Wood River and in the Pilgrim River drainage near Nome on the Seward Peninsula. Permits are free and may be obtained from the local Department of Fish and Game office prior to fishing.

Bristol Bay Area: The outer Naknek-Kvichak boundary was extended approximately five miles at the west end to Tank Creek.

The Egegik outer boundary was enlarged to a rectangular area projecting three miles offshore from Big Creek, due south approximately eight and one-half miles, and then due east three miles to a shore marker at Abalama Creek.

The Egegik inner boundary was enlarged slightly to just below Egg Island.

The inner boundary line of the Ugashik district was adjusted slightly to a straight line across the Ugashik River 500 yards below the terminus of King Salmon River.

A new regulation was adopted which requires each fisherman to indicate at the time of initial registration whether he is operating as an independent or a company.

Other slight changes were made in the dates to allow for calendar changes in 1964.

Alaska Peninsula Area: The Herendeen-Moller Bay section will open to fishing with set nets, drift nets, hand purse seines, and purse seines from May 4 through July 17. Closures were placed on the heads of the bays to give the milling areas protection.

All other changes concerned closed areas. Sandy and Bear Rivers will be closed 2,000 yards off the mouths during the peak of the runs, after which they will be reduced to 500 yards.

Warm Springs Bay will be closed 1 mile from the mouth of the main stream.

The closure at Thin Point Cove and Lagoon was extended to encompass the entire cove. The closure at the head of Cold Bay was enlarged.

Also adopted was an extension of the closure at San Diego Bay to 1 mile after July 18, and the upper end of Stepovak Bay, from Dent Point to Kupreanof Point, will close after July 15.

A razor clam season was opened with hydraulic dredges, forks, and shovels as legal gear.

No changes were made in the Aleutian Islands Area.

Chignik Area: Opening and closing dates for the Eastern district were adopted for taking salmon as follows: June 8 through Au-

gust 14 and from August 31 through September 25. This district formerly was opened and closed by field announcement.

Use of a hydraulic clam digger is now legal and a season for razor clams was established, January 1 to July 15 and September 15 to December 31. Hardshell clams may be taken from January 1 to December 31.

Kodiak Area: The Moser-Olga Bay and Alitak Bay sections of the Alitak district will open on July 13 and close on August 14. The weekly fishing period during this time will be seven days.

The Inner Karluk and Uyak sections of the Karluk district will have a mid-season closure from July 3 to July 13. The weekly fishing periods will be seven days to July 3, five days from July 13 to August 7, three days from August 10 to August 21, and seven days from August 24 to September 25.

The Uganik and Afognak sections of the Karluk district will be closed from July 3 to July 13 with a seven day weekly fishing period.

The Red River, Sturgeon River, Uyak Bay, Uganik, Afognak, General and Mainland districts will have a five day weekly fishing period from June 1 to July 17, and a seven day weekly fishing period from July 20 to September 25.

The inshore end of all set nets must be attached to the shore above mean low water in 1964.

The Deadman Bay, East Arm (Mush Bay), Sharatin Bay, and Seal Bay closures were enlarged.

Legal gear for taking razor clams will include hydraulic mechanical diggers.

Cook Inlet-Resurrection Bay Area: Regulatory changes enacted by the Board of Fish and Game for the Cook Inlet-Resurrection Bay Area for 1964 include closing the king salmon season to commercial fishing. Provision was made that king salmon caught accidentally while fishing for other species may be used for subsistence and welfare purposes only. Along with this major conservation move, the Board set June 25 as opening date for other species of salmon in the Northern, North Central, and South Central districts. Opening date for these districts last year was

June 6; most of the Inlet's king salmon catch in recent years has been taken prior to June 25. In another move aimed at helping to re-build depleted king salmon runs in the Inlet, the Board established a maximum mesh size of six inches for all gill nets in the Inlet.

Other action by the Board on Cook Inlet-Resurrection Bay regulations includes re-defining the Southern and Kamishak Bay districts to allow a larger area for unlimited pot fishing by king crab fishermen, and a southern boundary at the latitude of Cape Douglas was established for both the Outer and Eastern districts. June 8 was set as opening date for the Southern district, and all opening and closing times for salmon fishing were changed to 9:00 a.m. A seven day week fishing period was established for the Kamishak Bay district. Gill nets were made illegal in the eastern district, except for subsistence fishing, and all set nets are now to be restricted to 45 meshes in depth.

The east shore of Port Graham was closed to fishing by set nets, and three traditionally fished set net areas near Harriet Point were opened to set nets.

New subsistence fishing regulations include a mandatory permit for salmon and freshwater species (except that no trout, grayling, or char may be taken for subsistence in fresh water), and a report is required of all subsistence fish taken. A limit of 50 salmon was set for subsistence fishermen, and no subsistence fishing will be allowed in areas closed to commercial fishing for salmon except for the northwest shore of Knik Arm. Subsistence fishing will not be allowed north of Cottonwood Creek on Knik Arm.

Except for the opening dates, subsistence fishing in the Northern, North Central, South Central, and Southern districts will be in conformance with all commercial regulations, with identification of gear to consist of name and address of owner. August 20 has been set for opening dates for subsistence fishing in the North Central, South Central and Southern districts, with August 3 for the Northern district, except for that part of the district in the Moquawkie Indian Reservation, which opens June 25 for subsistence fishing.

Subsistence fishing in the Eastern and Outer districts will be in conformance with commercial regulations, and identification of fishing gear shall consist of name and address of

owner. Subsistence set nets will be allowed in the Eastern and Southern districts in all areas of these districts open to commercial fishing for salmon.

Prince William Sound Area: The Prince William Sound purse seine season will open July 13 with a weekly fishing period from 6:00 a.m. Monday to 6:00 a.m. Saturday. Also in 1964, purse seines will be allowed to fish with drift gill nets in the early Coghill district fishery. Eshamy district will be closed again in 1964.

Changes in the crab fishery included a color-marking system for crab-pot buoys instead of the present numbering system. To allow additional crab fishing area, open throughout the year, the "inside" area north boundary was changed to run from Johnstone Point to Sheep Point.

Copper and Bering River drift gill-net districts will open May 14. Changes in the subsistence fishery were made to restrict the up-river fishing to the main Copper River. In addition, the lower Copper River subsistence limit was reduced, allowing a catch of five kings, ten reds, and ten silvers.

Yakutat Area: No changes were made in the Yakutat regulations from those in effect during 1963.

Southeastern Alaska Area: Several of the fishing districts had minor changes in that some sections were renumbered and one district, number 9 in Southern Chatham Strait, was divided into two sections: 9-A on the west side and 9-B on the east.

District 1 in the Ketchikan area was re-divided into six sections.

Seymour Canal in District 11 was designated as Section 11-D.

The section changes are to simplify emergency regulations and will be incorporated into the new Southeastern maps that accompany the printed regulations.

Trolling 7 days per week in District 8 was extended to include the whole district instead of the old "extended area;" this to be effective except during the gill net season, when both types of gear will fish three days per week.

Troll restrictions were relaxed in Kootznahoo Inlet, Idaho Inlet, Tenakee Inlet, Port

Althorp and off the Salmon River in Icy Passage.

Commercial dungeness crab fishing was prohibited in several bays near Ketchikan: Carroll Inlet, George Inlet, Bostwick Inlet, Traitors Cove, Smugglers Cove, Spacious Bay, Moser Bay, Helm Bay, Yes Bay, and Port Stewart.

Minimum mesh sizes for shrimp trawls were prescribed for cotton and synthetic mesh in Districts 6, 8, and 10.

The purse seine regulations had one minor change adopted requiring the marking on the cork line of all purse seines, every ten fathoms of length by double corks, that must be of a color that is in contrast with the color of the corks in the cork line.

All purse seine openings are to be by field announcement.

Amendments to the gill net section of the regulations provide for opening dates in sections 1-A and 1-B (formerly 1-B and 1-C), on June 14, sections 6-A and 6-B open on June 15.

Additional areas were added to the list of closed waters in 115.21. Among them were Edwards Passage, Nakat Bay, Nossuk Bay, Salt Lake Bay, Navy Creek, Canoe Pass, Menefee Inlet and Union Bay. The closure in Redfish Bay in District 13 was relaxed. (Alaska Department of Fish and Game, December 20, 1963.)

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COOK INLET CLOSED TO KING SALMON FISHING IN 1964:

In December 1963, the Alaska Board of Fish and Game issued regulations closing Cook Inlet to all king salmon fishing (both sport and commercial) during 1964. It had become apparent that this once important run of fish was declining in abundance. The most obvious cause was overfishing.

During the late 1930's and the 1940's the annual commercial catch of king salmon in the Cook Inlet area was steady at around 77,000 fish and in 1951 it increased to a high of 187,000. But the largest catch since 1958 was only 28,000 fish with a low of 17,600 in 1963. The sport fishery has brought increasing pressure on the resource as the number

of people in the Anchorage and Kenai areas has grown.

Since 1959, sport and commercial fishing for Cook Inlet king salmon has been increasingly restricted, but king salmon escapement has not improved. It was felt, therefore, that drastic action was needed to rebuild the run before it declined to a point where extensive and expensive artificial aids would be needed for recovery. The Alaska Commissioner of Fish and Game pointed out that many miles of spawning streams used by Cook Inlet king salmon remain intact and have the fish-producing potential of the 1940's. What is required is a greater number of fish on the rearing grounds. This should be provided by the action taken by the Alaska Board of Fish and Game. (Alaska Department of Fish and Game, December 14, 1963.)

* * * * *

FOREIGN FISHING EFFORTS REDUCED IN OCTOBER 1963:

With the onset of autumn storms in the Gulf of Alaska and Bering Sea, Soviet and Japanese fishing efforts continued to decline. By the end of October most vessels had departed the Gulf area. The Soviet fleet strength diminished to less than 20 vessels in waters off Alaska and Japanese fisheries comprised about 20 vessels in the eastern Bering Sea at the close of October 1963.

U.S.S.R.: The trawl fisheries off southwest Kodiak Island, which since early summer 1963 have received the major Soviet effort, were continually reduced throughout October and by the last week of that month had entirely withdrawn from the area. Soviet fisheries had then dwindled to relatively minor trawling efforts in the mid-Aleutian chain region and a whaling fleet operating far west in the Attu Island area.

Japan: Japanese fishing efforts during October were reduced to a shrimp fishery near the Pribilof Islands and two factory trawlers conducting "exploratory" fishing off southwest Kodiak. The Japanese "exploratory" efforts in the Gulf of Alaska were scheduled to terminate at the end of October 1963.

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UNIVERSITY OF ALASKA APPOINTS FISHERY EXTENSION COURSE SPECIALIST TO FACULTY:

The University of Alaska has appointed John P. Doyle as a member of its faculty to

to conduct extension education courses for commercial fishermen patterned after the University's prospecting and mining extension courses. This development is a direct result of the enthusiastic acceptance of the Fisherman's Short Courses offered the past two years by the University of Alaska in cooperation with the Ketchikan Technological Laboratory.



Alaska Fishery Investigations

LARGE RED SALMON SPAWNING POPULATION DISCOVERED IN NAKNEK RIVER:

In early October 1963, while preparing the King Salmon station for the winter, several trips were made by U. S. Bureau of Commercial Fisheries biologists to the outlet of Naknek Lake to observe the progress of red salmon spawning. In the past it was known that reds spawned in the upper end of the Naknek River, but it was thought their numbers were insignificant in relation to those occupying the better known areas in the upper lakes of the system. Observations made in the fall of 1963 indicate that, at times, spawners utilizing that area represent a substantial segment of the Naknek run. That section may have escaped notice up to now because the spawners are difficult, if not impossible, to observe from the air because of water depth and coloration of the bottom.

Spawning took place over a distance of about three miles, from one-half mile below Gull Island to the head of the rapids. Spawning began in the first week in September and continued through the first week in October, occurring first in the area just above the rapids. By mid-October 1963 only a few spawners were left on the shallow shelf at the outlet.

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KARLUK RIVER RED SALMON SPAWNING VERIFIED:

The upper Karluk River study was terminated on October 1, 1963, and Portage weir was removed. A mark and recapture technique was used to estimate the number of red salmon spawning in the upper Karluk River. Salmon were tagged at Karluk Portage, on the Karluk River seven miles downstream from the lake outlet, and tagged fish entering the lake were recorded as they passed through Karluk weir. An estimated 47,000 red salmon,

representing 10 percent of the total escapement, remained in the river to spawn. The fraction remaining in the river to spawn is in close agreement with past estimates based on aerial surveys. Adult escapement of red salmon to Karluk Lake numbered 404,543 by October 14.

* * * * *

HEAVY FISHING RATE SHOWN ON TAGGED KING CRABS:

About 20 percent of the tagged king crab released during August and September 1963, have been recaptured by fishermen on the Portlock and Albatross Banks north and east of Kodiak. It was expected that a further substantial percentage of the 1963 tags would be returned during the 1963/64 winter as the fishing effort intensifies in the offshore areas.

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SHRIMP POTS IN VERTICAL STRING FISH BETTER WITH BLACK MESH:

After preliminary trials in August 1963, a vertical string of six shrimp pots was set again in Tutka Bay in 45 fathoms of depth. Since there was a question of avoidance by shrimp of the pots covered with white nylon mesh, the pots were fished in black mesh--white mesh pairs at each level.

The results of this preliminary experiment were interesting. Light catches of shrimp were taken at all levels and the black mesh-covered pots appeared to be more effective than the natural white nylon at all levels except the topmost. At the 1-fathom level mostly pink shrimp were taken, pinks and coonstripe were caught at the 10-fathom level, and mostly coonstripes were taken at from 10 to 45 fathoms.



California

FISHERMEN'S INCOME, 1962:

About \$17,596,000 was paid in wages during 1962 to approximately 2,076 California fishermen covered by State unemployment insurance. The annual average wage paid the covered California fishermen was \$8,476. About one-half of California's covered fishermen worked out of ports in San Diego County and a little over one-third of the fishermen were from Los Angeles and Orange Counties.

The average wage paid to fishermen in 1962 was \$10,427 in San Diego County and \$7,956 in Los Angeles and Orange Counties. The average wage paid covered California workers in "all industries" in 1962 was \$5,891. (State of California, Department of Employment.)

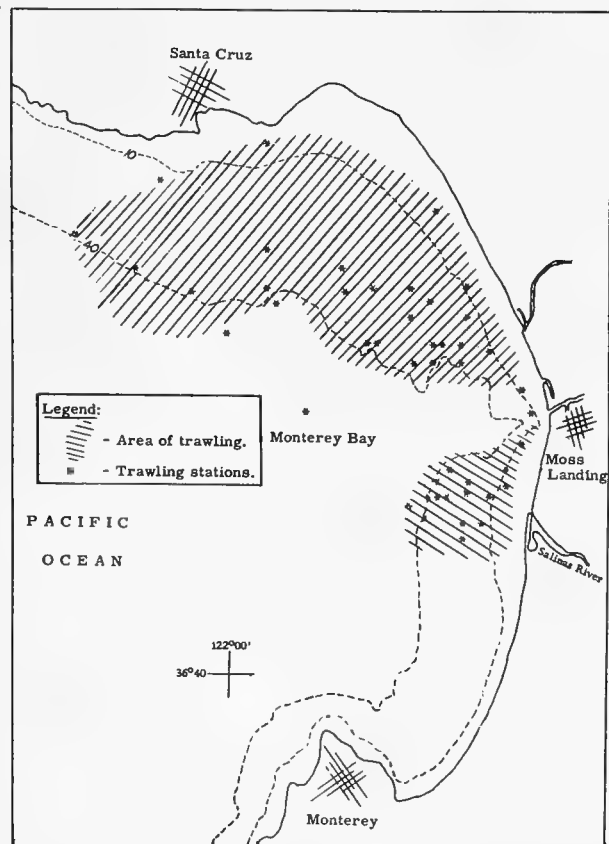
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GROWTH STUDIES OF ENGLISH SOLE AND BOTTOMFISH IN MONTEREY BAY:

M/V "Nautilus" Cruise 63-N-5a-b-Bottomfish (October 8-12 and December 3-7, 1963):

These two cruises to collect juvenile and adult English sole in Monterey Bay in the vicinity of Moss Landing were the first of a series by the California Department of Fish and Game research vessel Nautilus. The fish were measured, and interopercle bones were taken for age determinations to be used in growth analysis.

A modified $1\frac{1}{4}$ -inch mesh Gulf of Mexico shrimp trawl with a 1-inch cod end was used on these cruises. Trawling covered both sides



Cruises 63-N-5a and b (bottomfish) by research vessel Nautilus, showing trawling area and stations.

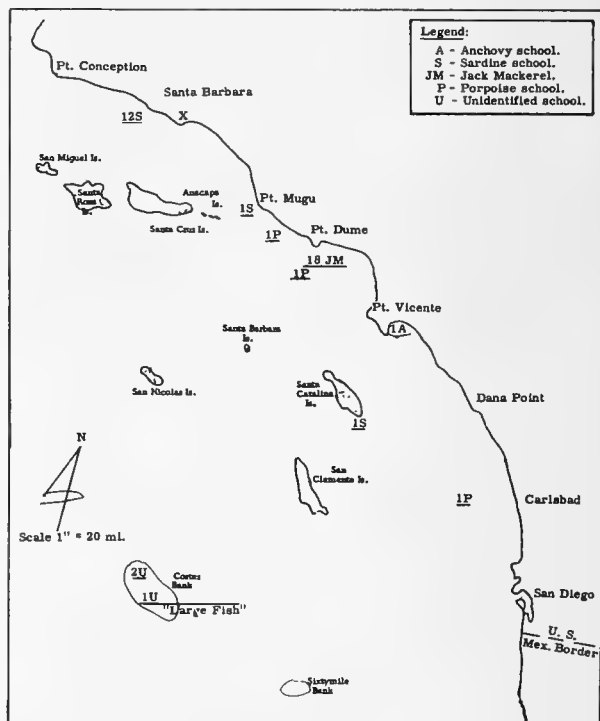
of Monterey Canyon in depths of 5 to 48 fathoms and the net was towed about 15 minutes at each station.

A total of 44 trawls was made during both cruises. From the stations worked, 1,372 juvenile and adult English sole were measured and their sex determined. The fish ranged from 86 to 380 millimeters (about 3.4 to 15 inches) long. Females were most abundant in the 200-250 millimeter (about 7.9 to 9.8 inches) size group. Two interopercle bones from each centimeter size group were selected for each sex. Samples of Dover sole (Microstomus pacificus) and petrale sole (Eopsetta jordani) were also measured and their sex determined. All cephalopods were preserved for study.

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PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 63-10 (October 8-9, 1963): Surveys to determine the distribution and abundance of pelagic fish schools in the southern California area were continued by the California Department of Fish and Game Twin Beechcraft N5614D in the inshore area from Point Conception to San Diego and the



Pelagic fish survey flight 63-10.

offshore islands and banks off southern California and northern Baja California, Mexico.

General haze throughout the flight area (Pt. Vicente to San Diego, Sixtymile and Cortez Banks, and San Clemente and Santa Catalina Islands) on October 8, reduced aerial visibility to 15 miles. Water visibility was good although there was some surface glare.

At Cortez Bank, one school of large tuna-like fish was seen but not identified as to species. Two schools of smaller unidentified fish were also seen. Positive identification was not possible because those fish sounded whenever the plane passed overhead. One small school of Pacific sardines (Sardinops caeruleus) was seen off Church Rock at the south end of Santa Catalina Island.

On October 9, the inshore area between Pt. Vicente to Point Conception and the offshore area in the vicinity of San Miguel, Santa Cruz, and the Anacapa Islands were surveyed.

Air and water visibilities were fair. No fish schools were sighted around the islands. In northeast Santa Monica Bay, between Pt. Vicente and Pt. Dume, 18 jack mackerel (Trachurus symmetricus) and 2 unidentified porpoise schools were seen. Twelve schools of sardines were noted north of Santa Barbara and one off Pt. Mugu.

Note: See Commercial Fisheries Review, December 1963 p. 17, November 1963 p. 21, September 1963 p. 14.

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Airplane Spotting Flight 63-11 (October 14-17, 1963): The survey to determine the inshore distribution and abundance of pelagic fish schools was continued by the California Department of Fish and Game Cessna "182" 9042T during flights over the inshore area from the United States-Mexican Border to Monterey, California.

The area from Point Vicente to Monterey was flown on October 14. Weather and visibility were poor south of Jalama Park (Point Arguello) but very good to the north. Water visibility followed the same pattern.

A large school group of northern anchovies (Engraulis mordax) was seen between Mussel Point and Piedras Blancas. This group, comprising 293 separate schools, was one of the largest observed from the air in several months. Many of the schools were being harassed by sea lions and porpoises from below and birds from above. Twenty-four anchovy

schools were counted in exceptionally clear water between Piedras Blancas and Point Sur where fish schools are seldom seen.

Coastal waters from the United States-Mexican Border to Point Vicente were scouted on October 15. Water visibility was poor. Air visibility was limited to 10 miles by haze and smoke. Thirty-two anchovy schools were sighted, all off the La Jolla-Torrey Pines area.

On October 16, the scheduled flight was cancelled by bad weather.

The inshore area from the United States-Mexican Border to Jalama Park was flown on October 17. Air and water visibility were only fair. Twenty-five schools of "pinhead" anchovies were seen off of the "barn," a sailor's landmark on Camp Pendleton. Eight killer whales (Orcinus orca) were seen 2 miles north and $\frac{3}{4}$ miles offshore from Point Dume; the 6 adults and 2 juveniles were slowly swimming south. This was only the second sighting of those mammals since the monthly flights were inaugurated in 1956.

Note: See Commercial Fisheries Review, Dec. 1963 p. 19.



Central Pacific Fisheries Investigations

TUNA STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 69-- Ahipalaha II (October 7-December 13, 1963): A study of the spawning seasons and spawning areas in the albacore fishing grounds of the South Pacific Ocean was the primary objective of this 10-week cruise by the U. S. Bureau of Commercial Fisheries; research vessel Charles H. Gilbert. The purpose of the cruise is reflected in its designation, for "ahipalaha" is the Hawaiian name for albacore tuna. The first survey in this series was made in the spring of 1962.

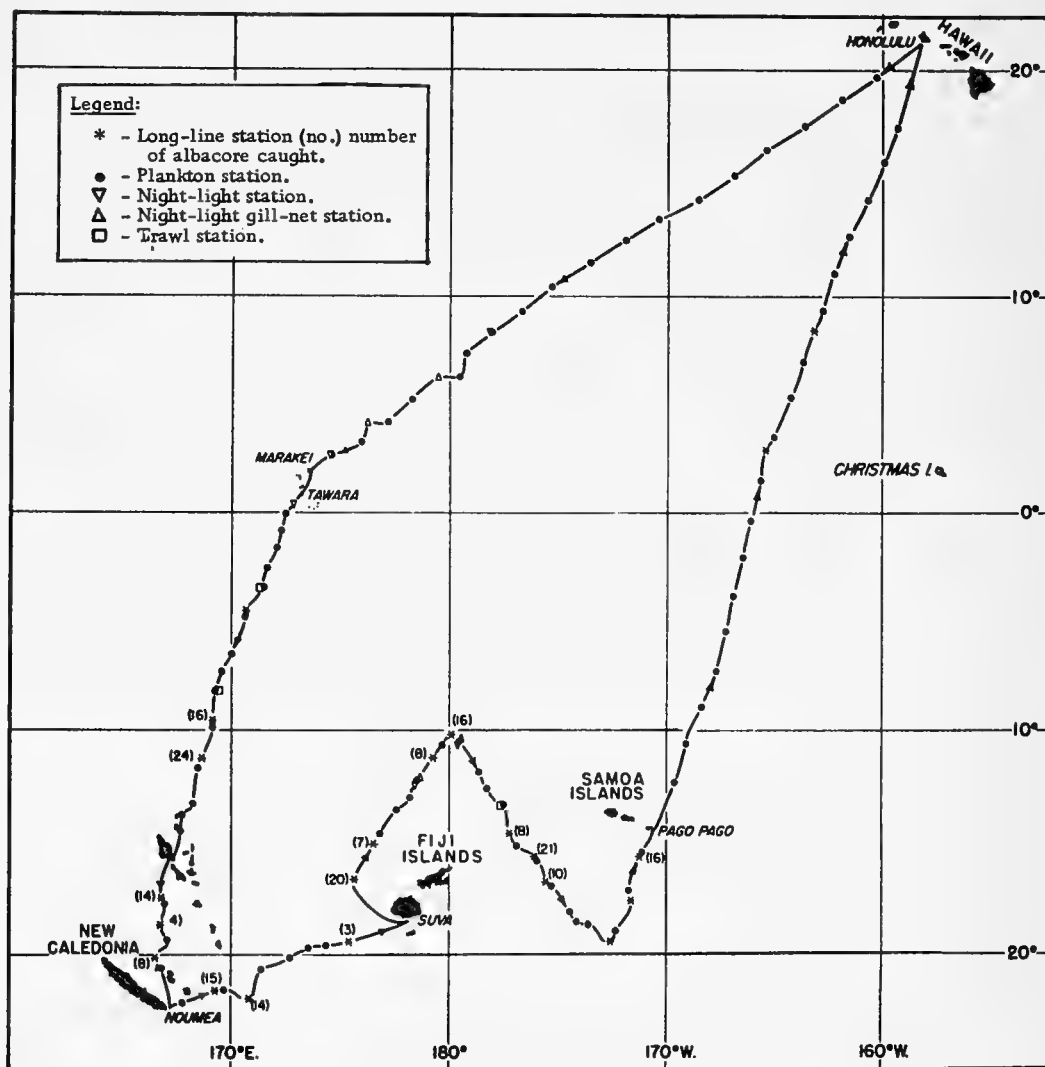
The investigation centered around the New Hebrides Islands, Fiji Islands, New Caledonia, and American Samoa. In that area, the expedition fished Japanese-type long-line gear for 19 days and took over 200 albacore. The rate of catch compared favorably with that of Japanese and Korean long-liners that work the same waters. In addition to the albacore, the 19 long-line stations fished within that area also yielded 21 yellowfin, 17 big-eyed, and 4 skipjack tuna, as well as 6 other tuna

which were damaged beyond recognition. Other species caught were: 10 spearfishes, 20 sharks, and 51 miscellaneous fish. The albacore (48 females, 147 males, and 9 unsexed) were generally large adults ranging in size from 85 to 108 centimeters (33.5 to 42.5 inches). Of the females, 21 percent had either spent or immature ovaries, 73 percent had maturing ovaries, and 6 percent had near-ripe ovaries, indicating that the albacore were not quite ready to spawn.

Scientists on the Charles H. Gilbert reported that the albacore were generally approaching a spawning condition, but were not quite ready to spawn. The expedition also made many hauls in the survey area with fine-

mesh nets designed to collect the young of tuna. Detailed laboratory study of the larval and juvenile specimens will provide a check on the information drawn from examination of adult spawners. The stomachs of large fish which prey on young tuna were also collected to provide an additional check on spawning information inferred from the examination of the adults.

Blood samples were collected from albacore, yellowfin, big-eyed, and skipjack tuna, and blue marlin. In addition, blood samples were collected from white-tip and great blue sharks. A sample of bloods was airshipped to the Bureau's Honolulu Laboratory from Suva, Fiji.



M/V Charles H. Gilbert, Cruise 69 (Ahipalaha II), October 7-December 13, 1963.

A total of 152 surface and 140-meter oblique plankton tows, three 6-foot Isaacs-Kidd trawl hauls, 8 night-light collections, and 4 small-mesh gill-net stations were made in order to capture larval and juvenile tunas. Gross examination of plankton samples at sea indicated the presence of a fair number of larval tunas. One juvenile tuna was caught by night-light fishing but nothing was taken by the small-mesh gill nets.

None of the tuna ovaries examined contained eggs in suitable condition for artificial fertilization. One sample of albacore eggs which was quite advanced in development, though not fully ripe, and measuring 0.88 to 1.06 millimeters (0.03 to 0.04 inches) in diameter, was fertilized, but due probably to unsuitable milt condition none of the eggs showed any sign of embryonic development. The milt used in this instance was quite thick and not freely flowing as those usually encountered in running ripe males.

One juvenile tuna of undetermined species about 4 centimeters (1.6 inches) long was caught at a night-light fishing station (latitude 08°10' N.; longitude 178°07' W.) on October 13. Shipboard rearing was not attempted because the juvenile tuna was in an extremely weakened condition.

Since emphasis was placed on the collections of data for serological and gonad condition studies, only a few albacore tuna were tagged. Seven albacore which were considered to be in good condition were tagged and released. Those albacore ranged in length from 89 to 99 centimeters (35 to 39 inches). In addition, three small yellowfin, 67 to 75 centimeters (26.4 to 29.5 inches) long, which came up in viable condition were tagged and released.

Other developments and observations during this cruise were as follows:

1. The condition of all albacore ovaries was noted. Although no ripe ovaries were encountered, a few ovaries were preserved for laboratory examination.

2. No ripe ovaries of other tunas or marlins were found.

3. Stomach contents of 128 fish were preserved.

4. Enough drift cards to make 34 releases were available for this cruise. These were

released with the first 35 bathythermograph (BT) observations.

5. The thermograph and barograph were operated continuously during the cruise.

6. A total of 197 weather observations were made at 0000, 0600, 1200, and 1800 G.C.T. daily and transmitted to the Weather Bureau whenever possible.

7. A total of 172 BT casts were made during the cruise. Surface salinity samples were collected with each BT cast.

8. Two lures were trolled during daylight hours. The catch consisted of only one dolphin.

9. During the cruise, 55 surface fish schools and bird flocks were sighted. Twelve were identified as skipjack tuna and 43 were unidentified.

10. All remoras found attached to fish and other objects were collected and brought back alive in the research vessel's bait tank, as requested by the University of Hawaii. The remoras will be used for physiological studies.

11. Flying fish that landed on deck were preserved.

12. Two long-line stations were fished in "big-eyed tuna waters," yielding only 2 big-eyed tuna, 2 yellowfin, 1 skipjack, 2 sharks, and 12 miscellaneous fish.

13. At Marakei Atoll, Gilbert Islands, a poison station was conducted to collect reef fishes for ichthyotoxism studies by a scientist of the University of Hawaii.

14. A participant scientist of the Agency for International Development (AID), studying tuna long-line fishing, completed the first phase of his training program aboard the Charles H. Gilbert. He disembarked at Pago Pago, American Samoa, to continue on the second phase of his training.

Note: See Commercial Fisheries Review, December 1963 p. 25.

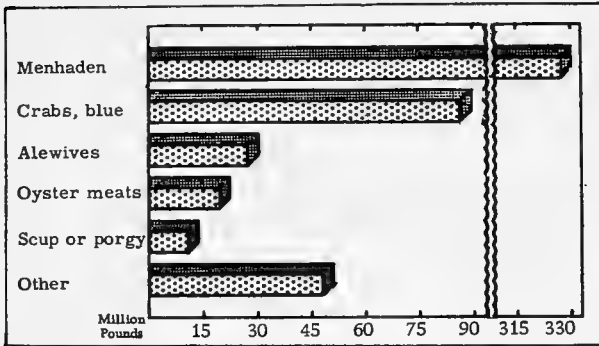


Chesapeake States

FISHERIES LANDINGS, 1962:

The 1962 commercial catch of fish and shellfish landed in the Chesapeake States

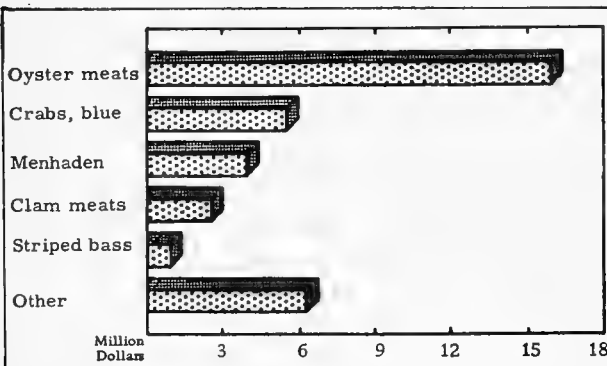
(Maryland and Virginia) totaled 521.5 million pounds valued at \$33.6 million ex-vessel. This was an increase of 43.6 million pounds or 9 percent but a decline of \$3.5 million (9 percent) compared with 1961.



Chesapeake States catch, 1962.

The gain in quantity was due chiefly to menhaden landings of 327.9 million pounds--29.2 million pounds more than in 1961. The catch of hard blue crabs (81.3 million pounds) exceeded the peak production of 1950 by 7.4 million pounds and established a new record. The production of alewives (more than 27 million pounds) was up about 10 million, and there were moderate increases in production of sea bass, spot, white perch, and clams over the previous year. The yield of oyster meats (20 million pounds) declined 7.6 million pounds, while slighter decreases occurred in the catch of croaker and striped bass.

The decline in value resulted largely from reduced landings of high-priced oysters. The value would have dropped even



Value of Chesapeake States catch, 1962.

more except for the increased production of crabs and menhaden.

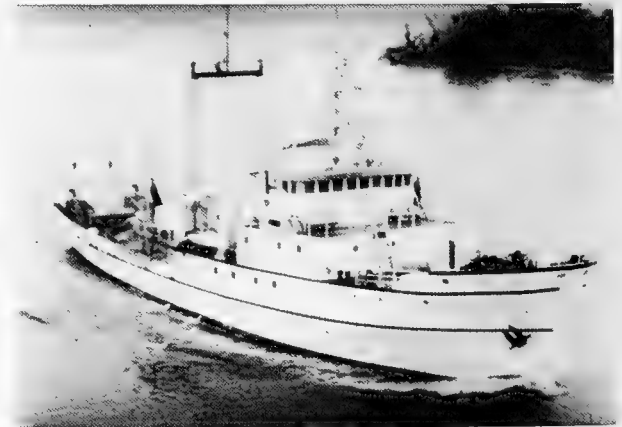
Virginia landings of 454 million pounds accounted for 87 percent of the total production in the Chesapeake States. Virginia also led in value of the catch with \$21.7 million or 65 percent of the total. The Maryland and Virginia catch was taken by 16,806 fishermen operating in 1,191 vessels of 5 or more net tons, 8,759 motor boats, and 1,045 other boats.



Films

NEW FILM ON OCEANOGRAPHY PRODUCED BY U. S. NAVY:

A new motion-picture film, "Oceanography--Science for Survival," was previewed by the Interagency Committee on Oceanography (ICO) on November 21, 1963. The film is in color, has a sound track, and runs 42 minutes. It was financed by the United States Navy and produced by the Naval Photographic Center.



This picture of an oceanographic survey ship under way is taken from the Navy's newest motion picture, "Oceanography--Science for Survival."

Early in 1964 the film will be distributed under the auspices of the ICO. The film gives an excellent, fast-moving account of Government oceanography activities, including those of the U. S. Bureau of Commercial Fisheries. It begins and ends with scenes

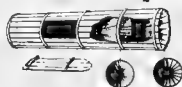
in which the late President Kennedy speaks in behalf of a strong National Oceanographic Program. The work of the Federal Council for Science and Technology and of the ICO in coordinating the oceanographic program is strongly emphasized. The film serves a useful purpose in explaining oceanography to Members of Congress, to students, and to the public in general.



Fish Farming

SLAT TRAPS TESTED FOR HARVESTING FISH PONDS:

To determine their effectiveness for catching small numbers of catfish on short notice, slat traps were tested in the fall of 1963 in an Arkansas fish pond. The testing was done by gear experts of the U. S. Bureau of Commercial Fisheries. An apparent relationship to the catch rate was the decoying effect of early-caught catfish attracting others to the same trap. One fairly high catch of 121 pounds of channel catfish made during a 48-hour set emphasized the decoying effect. Over one-half of the fish were reported taken by one of the 10 traps set, and it was jammed so full that one more fish could not have forced itself through the opening. This behavior is successfully used in other fresh-water fisheries and Bureau personnel will continue to study it in future slat-trap fishing tests.



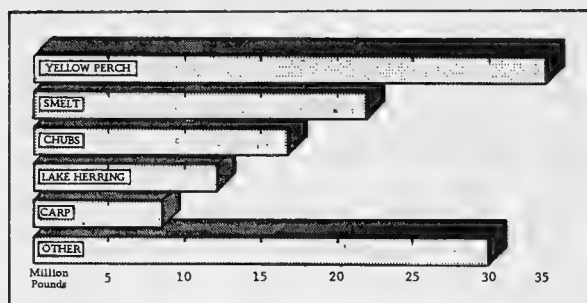
Great Lakes

FISHERIES LANDINGS, 1962:

The 1962 United States and Canadian commercial catch of fishery products in the Great Lakes, Lake St. Clair, and the International Lakes of northern Minnesota amounted to 123.4 million pounds. The catch was 3 million pounds more than in 1961, with domestic landings accounting for slightly more than half of the total volume.

From those lakes in 1962, United States fishermen took 65.6 million pounds of fish valued at \$5.5 million. The quantity declined 5 million pounds (7 percent) and the value, \$1.4 million (21 percent) compared with 1961. The reduction in value resulted largely from increased landings of low-priced fish taken

for industrial use and a decline in the catch of fish taken for human food.



United States and Canadian catch, 1962.

United States landings of sheepshead, chubs, and lake herring declined sharply in 1962 and slighter decreases occurred in the production of smelt, white bass, catfish, yellow pike, carp, common whitefish, and suckers. There was a substantial increase in the catch of yellow perch and alewives during 1962 while tullibee landings were up slightly compared with the previous year.

The State of Michigan led in production with a catch of over 22 million pounds--a loss of more than 2 million compared with 1961. Wisconsin was next with landings totaling 19 million pounds (down nearly 3 million from 1961), while Ohio was in third place with a catch of 15 million pounds--slightly less than a year earlier.

For the third successive year, Lake Michigan was the leading contributor to the United States catch with a take of 23.5 million pounds--down 2 million from 1961. Lake Erie was second with 19.7 million pounds, followed by Lake Superior with landings of 12.6 million pounds. The Lake Erie production was about the same as the previous year but the Lake Superior catch fell 2 million pounds below the 1961 level. Catches in the remaining lakes showed little change compared with 1961.



Great Lakes Fisheries

Exploration and Gear Research

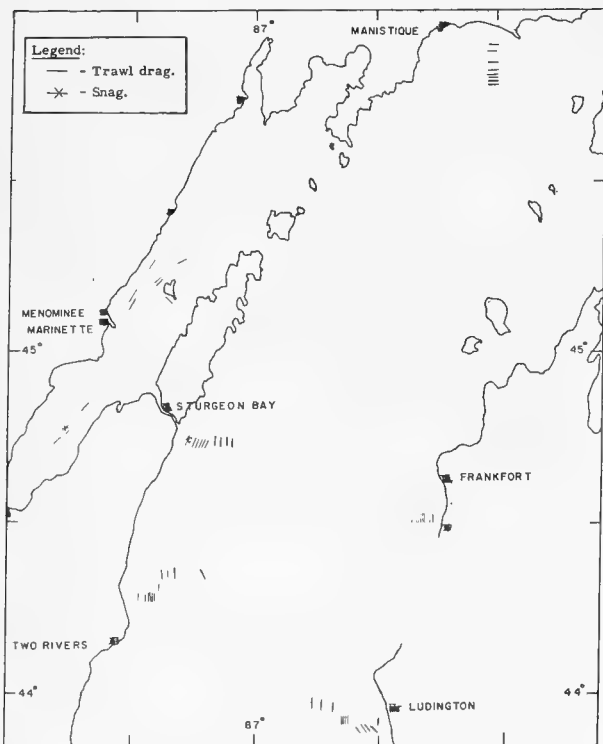
TRAWLING INVESTIGATIONS IN NORTHERN LAKE MICHIGAN AND GREEN BAY CONTINUED:

R/V "Kaho" Cruise 14 (October 23-November 25, 1963): The fourth in a series of cruises

to determine the commercial feasibility of otter trawling in Green Bay and northern Lake Michigan has been completed by the U. S. Bureau of Commercial Fisheries research vessel Kaho. Technical objectives of the cruise were to extend seasonal knowledge concerning (1) geographic and depth distribution of various fish stocks, (2) effectiveness of commercial-type otter trawls for catching abundant species such as alewife, chub, and smelt, and (3) effects of trawling on certain protected species.

Alewife were taken in all areas fished except off Frankfort, and chubs were taken in all areas fished except in Green Bay and off Manistique. Although the four cruises have provided good indications that trawling is feasible in these waters, production rates have been somewhat smaller and species composition of catches is different from that experienced in the lower end of Lake Michigan.

A portion of the time originally scheduled for this cruise was utilized for a short survey in the Whitefish Bay area of Lake Superior in an effort to determine the suitability of otter-trawl gear for taking lake herring (cisco).



Lake Michigan explorations R/V Kaho Cruise 14 (October-November, 1963).

A total of 65 drags was made with a 52-foot (headrope) Gulf of Mexico type fish trawl during 17 days of operation. Twelve drags were made in Green Bay and 53 were made at 5 stations in Lake Michigan proper. Depths fished ranged from 4 fathoms in Green Bay to 80 fathoms in Lake Michigan.

All drags were of 30 minutes except for three shorter ones in Green Bay which included one that hung up and two that were terminated when set nets were encountered and one other drag in Green Bay which lasted 80 minutes.

Bottom topography and bathymetric distribution of fish were continuously recorded with a high-resolution, "white-line" type depth recorder. Obvious rough bottom areas were avoided during the cruise, and relatively minor gear damage was experienced during only two drags.

FISHING RESULTS, GREEN BAY: Two catches of alewife--800 and 900 pounds--were taken at 4 and 5 fathoms in the southern end of the bay (see table 1). Four catches of alewife, ranging from 480 to 625 pounds, were made at depths of 10, 12, and 20 fathoms just north of Menominee. Significant individual catches of smelt, spottail shiner, carp, and sucker of 320, 125, 85, and 50 pounds, respectively, were taken in separate drags. Other than the above, the catches included

Table 1 - Summary of Catch Rate and Species Composition Resulting from 30-Minute Trawl Drags at Stations in Green Bay

| Depth (Fms.) | Green Bay--South of Menominee | | | | | | Total Pounds Caught |
|-------------------------------|-------------------------------|------------|---------------|------------|---------------|------------|---------------------|
| | Alewife | | Smelt | | Other Species | | |
| | Pounds Caught | % of Catch | Pounds Caught | % of Catch | Pounds Caught | % of Catch | |
| 4 | 800 | 86 | 1/Tr. | - | 2/125 | 14 | 925 |
| 5 | 900 | 96 | Tr. | - | 40 | 4 | 940 |
| 7 | - | - | - | - | - | - | 3/ |
| 7 | Tr. | - | Tr. | - | 4/285 | 100 | 5/285 |
| 9 | 100 | 100 | - | - | Tr. | - | 5/100 |
| Green Bay--North of Menominee | | | | | | | |
| 10 | 530 | 100 | Tr. | - | Tr. | - | 6/530 |
| 12 | 480 | 97 | 15 | 3 | Tr. | - | 495 |
| 12 | 625 | 99 | 5 | 1 | Tr. | - | 630 |
| 12 | 100 | 100 | Tr. | - | Tr. | - | 100 |
| 19 | 160 | 80 | 40 | 20 | - | - | 200 |
| 20 | 150 | 83 | 30 | 17 | - | - | 180 |
| 20 | 480 | 60 | 320 | 40 | Tr. | - | 800 |

1/Tr. - trace, less than 1 pound.

2/Includes: 85 lbs. carp, 33 lbs. yellow perch, 7 lbs. sucker.

3/Snagged, tore net.

4/Includes: 190 lbs. spottail shiner, 75 lbs. sucker, 20 lbs. yellow perch.

5/Terminated drag in less than 30 minutes when gill nets were encountered. Catch figures equated to 30-minute period.

6/Equated to 30-minute period--actual catch was 1,400 lbs. in 80-minute drag.

Table 2 - Summary of Catch Rate and Species Composition Resulting from 30-Minute Trawl Drags at Certain Stations in Wisconsin Waters of Northern Lake Michigan

| Area | Nearest 5-Fathom Depth Interval | Alewife | | Small Chubs | | Large Chubs | | Other Species | | Total Pounds Caught |
|--------------|---------------------------------|---------------|------------|---------------|------------|---------------|------------|---------------|------------|---------------------|
| | | Pounds Caught | % of Catch | Pounds Caught | % of Catch | Pounds Caught | % of Catch | Pounds Caught | % of Catch | |
| Two Rivers | 10 | - | - | - | - | - | - | - | - | - |
| | 15 | 985 | 98 | 7 | 1 | 2 | - | 6 | 1 | 1,000 |
| | 20 | 700 | 93 | 20 | 3 | 1 | - | 1/29 | 4 | 750 |
| | 25 | 500 | 61 | 260 | 32 | 10 | 1 | 1/50 | 6 | 820 |
| | 30 | 400 | 52 | 275 | 36 | 14 | 2 | 1/76 | 10 | 765 |
| | 35 | 100 | 9 | 930 | 84 | 30 | 3 | 1/50 | 4 | 1,110 |
| | 2/40 | - | - | - | - | - | - | - | - | - |
| | 45 | 3/Tr. | - | 300 | 98 | 5 | 2 | Tr. | - | 305 |
| | 50 | Tr. | - | 150 | 96 | 2 | 1 | 5 | 3 | 157 |
| | 60 | - | - | 100 | 82 | 2 | 2 | 4/20 | 16 | 122 |
| 70 | - | - | 40 | 33 | 2 | 2 | 4/80 | 65 | 122 | |
| 80 | 5 | 13 | 10 | 25 | - | - | 4/25 | 62 | 40 | |
| Sturgeon Bay | 5/10 | - | - | - | - | - | - | - | - | - |
| | 15 | 700 | 97 | 1 | - | - | - | 1/24 | 3 | 725 |
| | 20 | 400 | 84 | 40 | 8 | 20 | 4 | 1/20 | 4 | 480 |
| | 25 | 600 | 61 | 250 | 26 | 30 | 3 | 1/100 | 10 | 980 |
| | 30 | 200 | 50 | 150 | 37 | 5 | 1 | 1/50 | 12 | 405 |
| | 35 | 150 | 25 | 400 | 67 | 12 | 2 | 1/38 | 6 | 600 |
| | 40 | 20 | 6 | 250 | 81 | 8 | 3 | 1/32 | 10 | 310 |
| | 45 | Tr. | - | 220 | 98 | 5 | 2 | Tr. | - | 225 |
| | 50 | Tr. | - | 100 | 89 | 2 | 2 | 4/10 | 9 | 113 |
| | 60 | - | - | 80 | 36 | - | - | 4/140 | 64 | 220 |
| 70 | - | - | 15 | 33 | - | - | 4/30 | 67 | 45 | |

1/Mostly smelt.

2/No effort--rough bottom conditions.

3/Tr. - trace, less than 1 pound.

4/Mostly sculpin.

5/Cod end damaged--no fish caught.

Table 3 - Summary of Catch Rate and Species Composition Resulting from 30-Minute Trawl Drags at Certain Stations in Michigan Waters of Northern Lake Michigan

| Area | Nearest 5-Fathom Depth Interval | Alewife | | Small Chubs | | Large Chubs | | Other Species | | Total Pounds Caught |
|------------|---------------------------------|---------------|------------|---------------|------------|---------------|------------|---------------|------------|---------------------|
| | | Pounds Caught | % of Catch | Pounds Caught | % of Catch | Pounds Caught | % of Catch | Pounds Caught | % of Catch | |
| Ludington | 10 | 40 | 98 | 1/Tr. | - | - | - | 1 | 2 | 41 |
| | 15 | 275 | 92 | 10 | 3 | 4 | 1 | 11 | 4 | 300 |
| | 20 | 650 | 70 | 250 | 27 | 14 | 2 | 11 | 1 | 925 |
| | 25 | 250 | 28 | 600 | 68 | 25 | 3 | 10 | 1 | 885 |
| | 30 | 100 | 9 | 1,000 | 88 | 30 | 3 | Tr. | - | 1,130 |
| | 35 | 50 | 8 | 550 | 90 | 9 | 2 | 1 | - | 610 |
| | 40 | - | - | 370 | 97 | 10 | 3 | - | - | 380 |
| | 45 | - | - | 370 | 99 | 5 | 1 | Tr. | - | 375 |
| | 50 | - | - | 270 | 88 | 5 | 2 | 2/30 | 10 | 305 |
| | 60 | Tr. | - | 100 | 67 | 5 | 3 | 2/45 | 30 | 150 |
| 70 | Tr. | - | 30 | 65 | 1 | 2 | 2/15 | 33 | 46 | |
| 80 | - | - | 20 | 57 | - | - | 2/15 | 43 | 35 | |
| Frankfort | 20 | Tr. | - | 170 | 85 | 29 | 15 | 1 | 0 | 200 |
| | 25 | Tr. | - | 335 | 86 | 54 | 14 | 1 | 0 | 390 |
| | 30 | Tr. | - | 1,100 | 98 | 19 | 2 | 1 | 0 | 1,120 |
| | 35 | Tr. | - | 630 | 96 | 24 | 4 | 1 | 0 | 655 |
| | 40 | - | - | 605 | 92 | 20 | 3 | 2/35 | 5 | 660 |
| | 45 | - | - | 540 | 89 | 20 | 3 | 2/45 | 8 | 605 |
| | 50 | - | - | 245 | 91 | 20 | 7 | 5 | 2 | 270 |
| | 60 | - | - | 500 | 84 | 15 | 3 | 2/80 | 13 | 595 |
| 70 | - | - | 90 | 34 | 5 | 2 | 2/170 | 64 | 265 | |
| 80 | - | - | 10 | 5 | - | 0 | 2/200 | 95 | 210 | |
| Manistique | 10 | 23 | 70 | 1 | 3 | - | - | 9 | 27 | 33 |
| | 15 | 41 | 57 | 2 | 3 | 3 | 4 | 3/26 | 36 | 72 |
| | 20 | 385 | 79 | 7 | 1 | 7 | 1 | 3/91 | 19 | 490 |
| | 25 | 360 | 84 | 45 | 11 | 16 | 4 | 4 | 1 | 425 |
| | 30 | 36 | 16 | 170 | 74 | 22 | 9 | 2 | 1 | 230 |
| | 35 | 23 | 11 | 180 | 84 | 11 | 5 | 1 | - | 215 |
| | 40 | 12 | 8 | 120 | 86 | 7 | 5 | 1 | 1 | 140 |
| | 45 | 35 | 21 | 125 | 73 | 6 | 4 | 4 | 2 | 170 |
| 50 | 250 | 75 | 70 | 21 | 10 | 3 | 5 | 1 | 335 | |

1/Tr. - trace, less than 1 pound.

2/Mostly sculpin.

3/Mostly smelt.

very small quantities of bullheads, burbot, lake herring, sculpin, trout-perch, whitefish, and yellow perch.

FISHING RESULTS, WISCONSIN WATERS OF LAKE MICHIGAN: Good to excellent catches of alewife, ranging from 400 to 985 pounds, were taken at 15, 20, and 25 fathoms in both areas fished and also at 30 fathoms off Two Rivers (see table 2). One large catch of chubs (960 pounds) was taken at 35 fathoms off Two Rivers. Other significant catches of chubs were obtained at 25 to 45 fathoms in both areas. Smelt and sculpins were the most common other species taken.

FISHING RESULTS, MICHIGAN WATERS OF LAKE MICHIGAN: The best catch of alewife made in Michigan waters was 650 pounds taken at 20 fathoms off Ludington. Fair catches were made at 20 and 25 fathoms off Manistique (see table 3). There is evidence that the 250 pounds of alewife taken in 50 fathoms off Manistique were caught from midwater concentrations as the net was being set or hauled. Very good catches of chubs, ranging from 515 to 1,120 pounds, were taken at 25, 30, and 35 fathoms off Ludington and at 30, 35, 40, 45, and 60 fathoms off Frankfort. Smelt and sculpins accounted for most of the other fish taken in these waters.

HYDROGRAPHIC DATA: Thirty-six bathythermograph casts were made, and air and surface water temperatures were recorded continuously. Surface water temperatures ranged from 56°-57° F. off Ludington early in the cruise to 45°-46° F. off Manistique late in the cruise.

* * * * *

**TRAWL GEAR TESTED
FOR CATCHING LAKE HERRING
IN EASTERN LAKE SUPERIOR:**

R/V "Kaho," Special Cruise, November 16-20, 1963: As part of the U. S. Bureau of Commercial Fisheries program to assist the Great Lakes fishing industry adjust to changing conditions, a preliminary exploratory cruise in the Whitefish Bay area of Lake Superior was conducted by the Bureau's research vessel Kaho. Fishing industry members had requested that trawl fishing gear be tested for catching lake herring when they are concentrated during the spawning season and most readily available. Usually at that time of year, prices for lake herring drop to a level that makes production with the traditional gill-net fishing

gear marginal. It is felt that trawling may prove to be an economical method under those conditions. The Michigan Department of Conservation cooperated fully in the operation.

It was not expected that a thorough investigation could be completed in a 5-day period. However, in spite of the slim chances for attaining success during the brief survey, the collection of general information in respect to bottom conditions and fish distribution in the Whitefish Bay area will be helpful in planning future Lake Superior operations.

Although lake herring fishing was the primary consideration this cruise, other information was gathered as follows: (1) seasonal abundance and distribution of various species, (2) commercial availability of all species to otter trawls, and (3) delineation of areas suitable for otter trawl fishing.

Fair catches of alewife and chub were taken in bottom trawls at depths greater than 30 fathoms. Smelt appeared to be widely scattered at depths between 20 and 38 fathoms, and those of salable size were caught in only small amounts. Lake herring, lake trout, and whitefish trawl catches were insignificant. Concentrations of lake herring near the surface were not located.

Seventeen trawl drags were made with a 52-foot (headrope) Gulf of Mexico-type fish trawl. Although efforts were made to keep each drag at a uniform depth, this was not always possible due to the uneven bottom topography. All trawl drags were of 30 minutes' duration, except 2, which were terminated when the net became fouled on bottom obstructions.

Commercially significant catches of chubs and alewife were taken at several localities in eastern Lake Superior. The best catch of chubs, 305 pounds, was obtained north of Whitefish Point at 34-36 fathoms. Alewife were taken in 6 drags and appeared to be most abundant in southern Whitefish Bay, where one drag yielded 200 pounds.

Herring apparently were either scarce or had not as yet concentrated prior to spawning because of the unseasonable mild weather this year. Only a few individuals were taken at 6 stations during the survey. Lake trout, both native and planted, appeared in 4 catches in amounts of 6 pounds or less. Two trawl drags

in depths of 20-21 and 32-34 fathoms yielded whitefish in amounts of 5½ and 5 pounds, respectively.

Smelt appeared to be widely dispersed throughout Whitefish Bay. Ten stations yielded smelt in amounts of 15 pounds, or less, however, most catches were small individuals (40 or more per pound).

Miscellaneous species appearing in very small numbers in the trawl catches were: pigmy whitefish, round whitefish, sculpin, spottail shiner, stickleback, and trout-perch.

Continuous echo-sounding (using a Kelvin Hughes MS-28 echo-sounder--30 kc/s, pulse

length 1 to 3 milliseconds) was carried on during both cruising and fishing operations. Although the Kaho cruised over 250 statute miles in and near Whitefish Bay, no surface or extensive midwater concentrations of fish were located. Near bottom concentrations of fish were noted at various depths beyond 15 fathoms. The survey revealed a bottom configuration inconsistent in form and composition. In general, shoal areas display highly irregular bottom topography while, beyond 10 fathoms, the slope becomes very steep until maximum depths are reached. A fair amount of good trawling bottom was located in the southern reaches of Whitefish Bay and north of Whitefish Point.

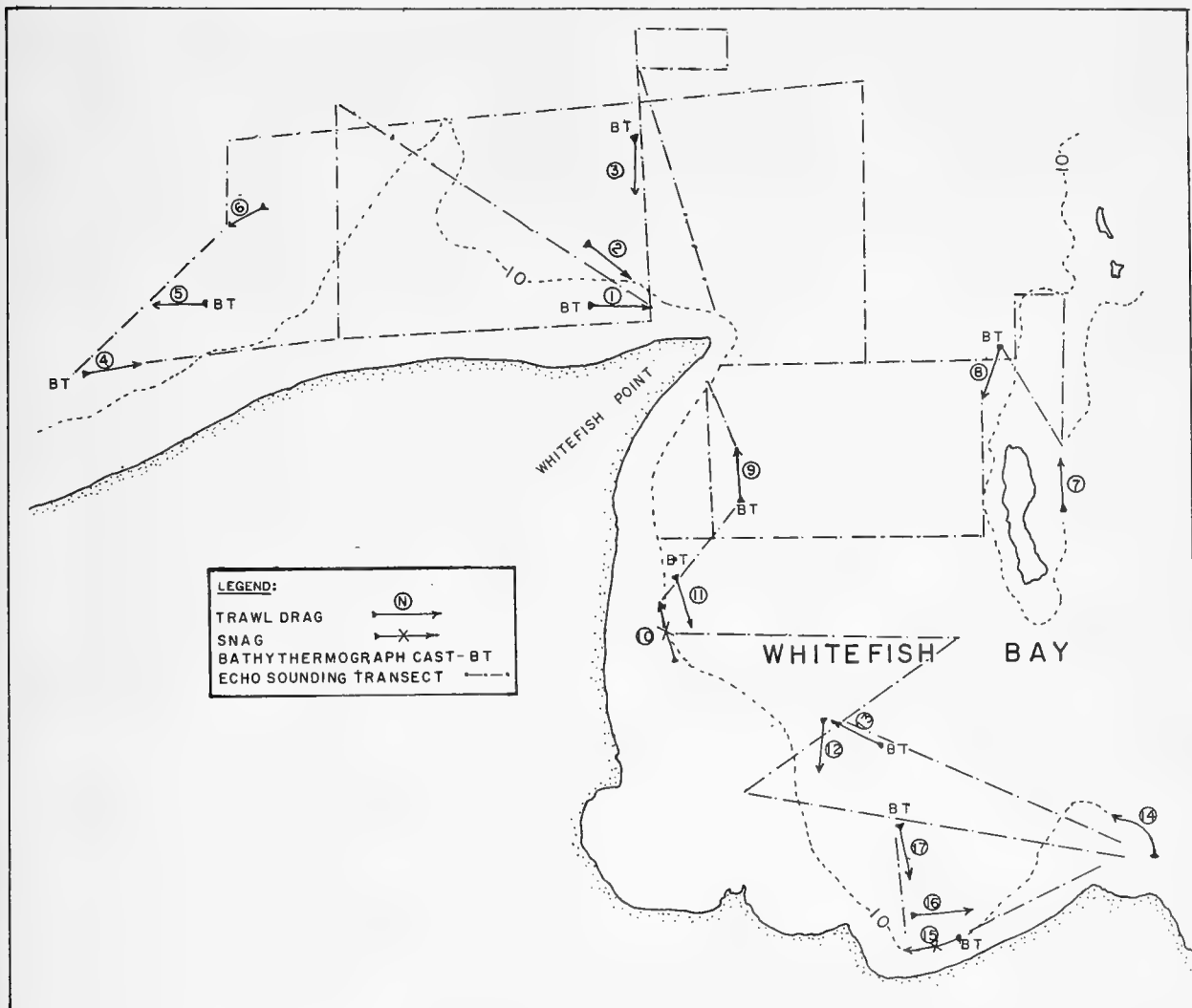


Fig. 1 - R/V Kaho Lake Superior explorations (November 16-20, 1963).

Ten bathythermograph casts were made at various stations to determine vertical thermal gradients. Surface water temperature ranged from 45.0° F. to 46.0° F. Bottom temperature

ranged from 45.0° F. at depths less than 28 fathoms to approximately 39.0° F. at depths of 36 fathoms.

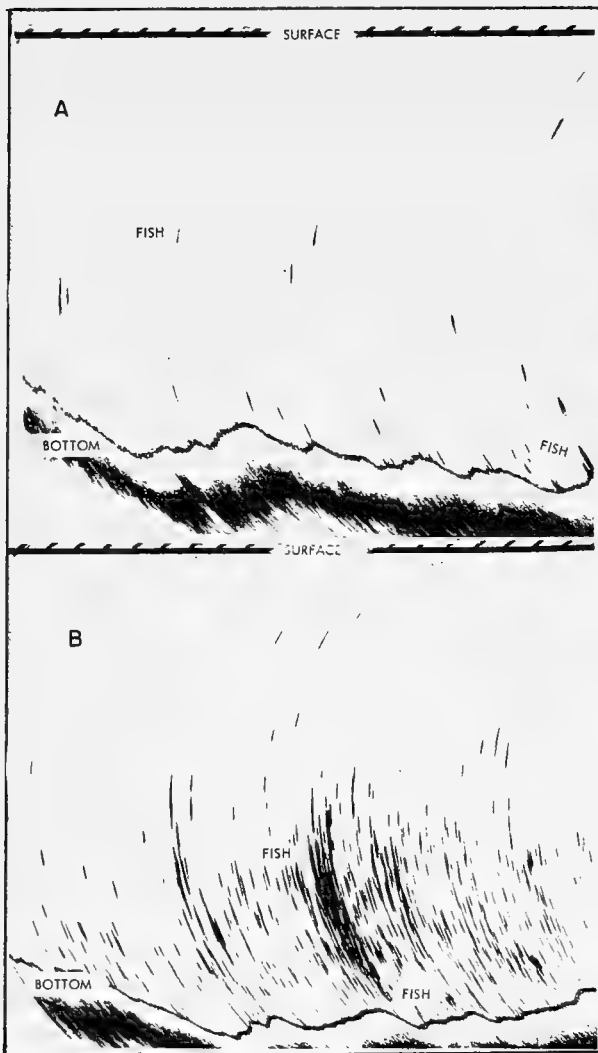


Fig. 2 - Echograms from a high-resolution echo-sounder showing concentrations of fish from the same area and depth (36 fathoms) during daylight and darkness. A - Distribution of fish at 8:30 a.m. B - Distribution of fish at 6:30 p.m. Distance covered is 4 statute miles.

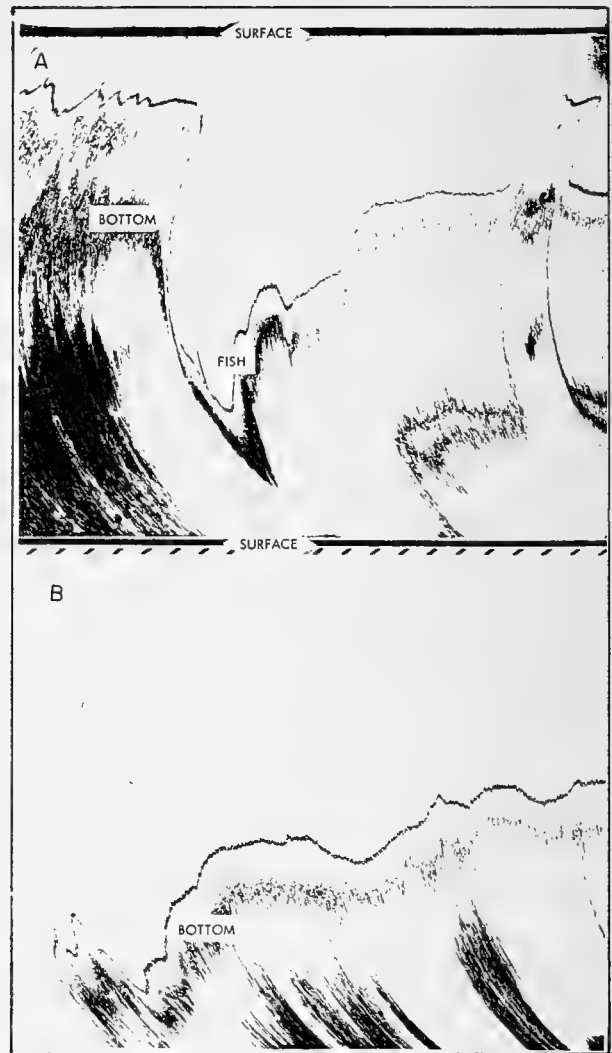


Fig. 3 - Echograms from a high-resolution echo-sounder showing typical bottom topography off shoal areas in Whitefish Bay, Lake Superior. A - Near Point Iroquois. B - Near Pendell Creek. Distance covered is 4 statute miles.

Gulf Exploratory Fishery Program

SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 48--
Phase II (November 6-27, 1963): To continue field tests of a prototype 40-foot electrical shrimp trawl was the purpose of Phase II of

this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers. Two modifications were made to the electrical gear prior to Phase II of the cruise. Changes were made in the electrode array to provide a more efficient distribution of electricity in the field, using the existing electrical equipment. Also, provision was made for using two pulse units on a single net, effectively increasing the electrical strength at the net. The specific objectives

of Phase II were to determine the effectiveness of the modified electrical gear as compared with the equipment used during Phase I of cruise 48.

METHOD OF OPERATION: A 40-foot flat trawl with 6-foot by 32-inch doors rigged with a tickler chain was fished on the starboard outrigger. The electrical trawl was fished simultaneously on the port side. The two nets were set and hauled at the same time and fished with identical warplengths. Drags were of one hour duration. Tests were conducted at night and during the day. The night tests were primarily to establish the approximate quantity of shrimp available in the area.

AREA OF OPERATIONS: Comparative trawling tests were conducted off Florida in the same area of the Apalachicola-Carrabelle area as during Phase I; specifically, in St. George Sound behind Dog Island in 3 fathoms, offshore approximately 15 miles southeast of Cape San Blas in 10-12 fathoms, and immediately south of St. Vincents Island in 4-5 fathoms. Tests were also conducted in St. Andrew Bay.

ST. GEORGE SOUND: Only one day was spent in that area. The only known change from the conditions present during Phase I was a drop in bottom temperature from 23° C. (73.4° F.) to 19° C. (66.2° F.). Results in this area followed the same general pattern as previously, although there were fewer shrimp present. Night drags yielded 15-20 pounds of pink shrimp per hour, with the electric gear again catching slightly more than the standard gear. The daytime catches with the electric trawl ranged from 6.5 to 11 pounds, compared to 3.5 to 4.5 pounds for the standard gear. The ratio of electric to standard catch per drag ranged from 1:5 to 2:1. The same factors were apparent as in Phase I. The electric gear produced more shrimp during daylight hours, but not as many as were available.

OFFSHORE CAPE SAN BLAS: Conditions were essentially the same during this phase, with the exception of water temperature, which had declined several degrees.

Night catches in this area dropped from 20 pounds the first night to 7 pounds on all following night tows. Daytime catches with the electric trawl ranged from several individuals to 4.5 pounds. The standard trawl usually produced no shrimp, but on one occasion 0.5

pound was caught. Attempts were made on several drags to slow the bottom speed and also to drag at an angle to the bottom contours and prevailing current. Weather and bottom conditions made it impossible to secure enough information to draw any conclusions.

ST. VINCENTS ISLAND: Physical conditions in the area were: bottom type--brown mud; water (surface)--green, turbid; bottom salinity--35.6-35.9 parts per thousand; bottom temperature--17.0° C.-17.5° C. (62.6°-63.5° F.). The electrode array used on drags in the area was modified by using two pulse generators simultaneously. Each pulse generator powered one-half of the electrodes. This provided a pulse of approximately twice the width of that obtained with a single power unit.

Night drags here yielded approximately 18 pounds per hour of white shrimp. Daytime catches with the electrical trawl ranged from 13 to 27 pounds; catches with the standard trawl ranged from 2 to 8 pounds.

ST. ANDREW BAY: Tests in this area were carried out with the same electrical system described above (dual pulse generators). Night fishing yielded pink shrimp catches of approximately 14 pounds per hour. Daytime catches with the electric gear ranged from 14 to 21 pounds, and with the standard trawl from 9 to 12 pounds.

CONCLUSIONS: The modification to the electrical system which produced a more uniform electrical field did not significantly improve catches over the original electrical system on either the soft or hard bottoms. But the increased strength of pulses achieved by using dual pulse generators appeared to produce the result sought, i.e., the electric trawl caught what shrimp were available. However, due to the limited testing, the results cannot be considered conclusive.

Phase III of cruise 48 was to be conducted during December 1963 in the Apalachicola-Carrabelle area using another pulse generator capable of producing various pulse widths and/or peak voltages. This unit should establish whether a greater peak voltage or a longer pulse than that used to date will successfully and consistently stimulate 100 percent of the shrimp available.

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M/V "George M. Bowers" Cruise 48-- Phase III (December 4-14, 1963): This Phase continued experimentation with the Bowers electrical shrimp trawl. Following Phase II, modifications were made to the electrode array to reduce line loss and a new pulse generator was acquired. This unit is capable of producing a much greater field strength than previously possible and is also capable of producing pulse characteristics not attainable with previous gear.

The primary objective of this phase was to determine whether or not inadequate field strength was the principal reason for reduced effectiveness of the electrical trawl on the offshore grounds. Bad weather severely limited tests on the offshore grounds; consequently tests were not as comprehensive as desired.

AREA OF OPERATIONS AND METHODS: Three areas were worked; (1) southeast of Cape San Blas in 10 fathoms, (2) immediately south of St. Vincents Island in 4 fathoms, and (3) in St. George Sound behind Dog Island. The latter two areas were worked when weather conditions precluded operations offshore. The experimental methods were the same as used during Phases I and II.

OFFSHORE CAPE SAN BLAS: The pink shrimp density, as indicated by night trawling here, was approximately 20 percent of that during Phase I, i.e., $4\frac{1}{2}$ pounds per hour per trawl (starboard and port trawls fished simultaneously) versus 22 pounds per hour. This was accompanied with significant changes in water temperature and general catch composition.

Daytime catches with the electric trawl ranged from $5\frac{1}{2}$ pounds to 7 pounds; with the standard gear from 0 to $1\frac{1}{4}$ pounds. Night catches with both trawls were 4 to $4\frac{1}{2}$ pounds.

ST. VINCENTS ISLAND: Catches of white shrimp both day and night in this area were too erratic to allow evaluation of the effect of the electrical gear. This was due probably to "schooling," vertical movements, burrowing behavior, or all three.

ST. GEORGE SOUND: Bottom temperature was down to 13° C. (55.4° F.) and the night catch density was down to 14 pounds per hour early in the trip and to 6 to 7 pounds at the end of the trip. Earlier work here yielded 30 pounds per hour. Day catches with the electric trawl ranged from 4 to 14 pounds per hour and

with the standard trawl from $\frac{3}{4}$ to $4\frac{3}{4}$ pounds. In all day tows the electric gear produced significantly greater catches than the standard gear.

DISCUSSION OF RESULTS: Results obtained during Phase III indicate the improved electrical characteristics achieved with the new pulse generator and electrode array produced daytime catches equal to or greater than night catches with the standard trawl. However, quantitative evaluation is difficult due to the changes in environment. These changes produced known reduction in shrimp density and unknown variations in their behavior patterns.

CRUISE 49: This cruise was scheduled for the Tortugas shrimp grounds during January-February 1964 to verify cruise 48 results on commercial concentrations. In addition to providing greater shrimp concentrations, the Tortugas grounds will provide a more stable environment than that which has existed in the Apalachicola-Carrabelle area recently. This should facilitate evaluation of results. Also, tests will be conducted with the electrode array built into the trawl. To date, the array has been operated separately in the manner of a tickler chain.

Note: See Commercial Fisheries Review, December 1963 p. 12.

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SURVEY OF SEASONAL DISTRIBUTION OF ROYAL-RED SHRIMP CONTINUED:

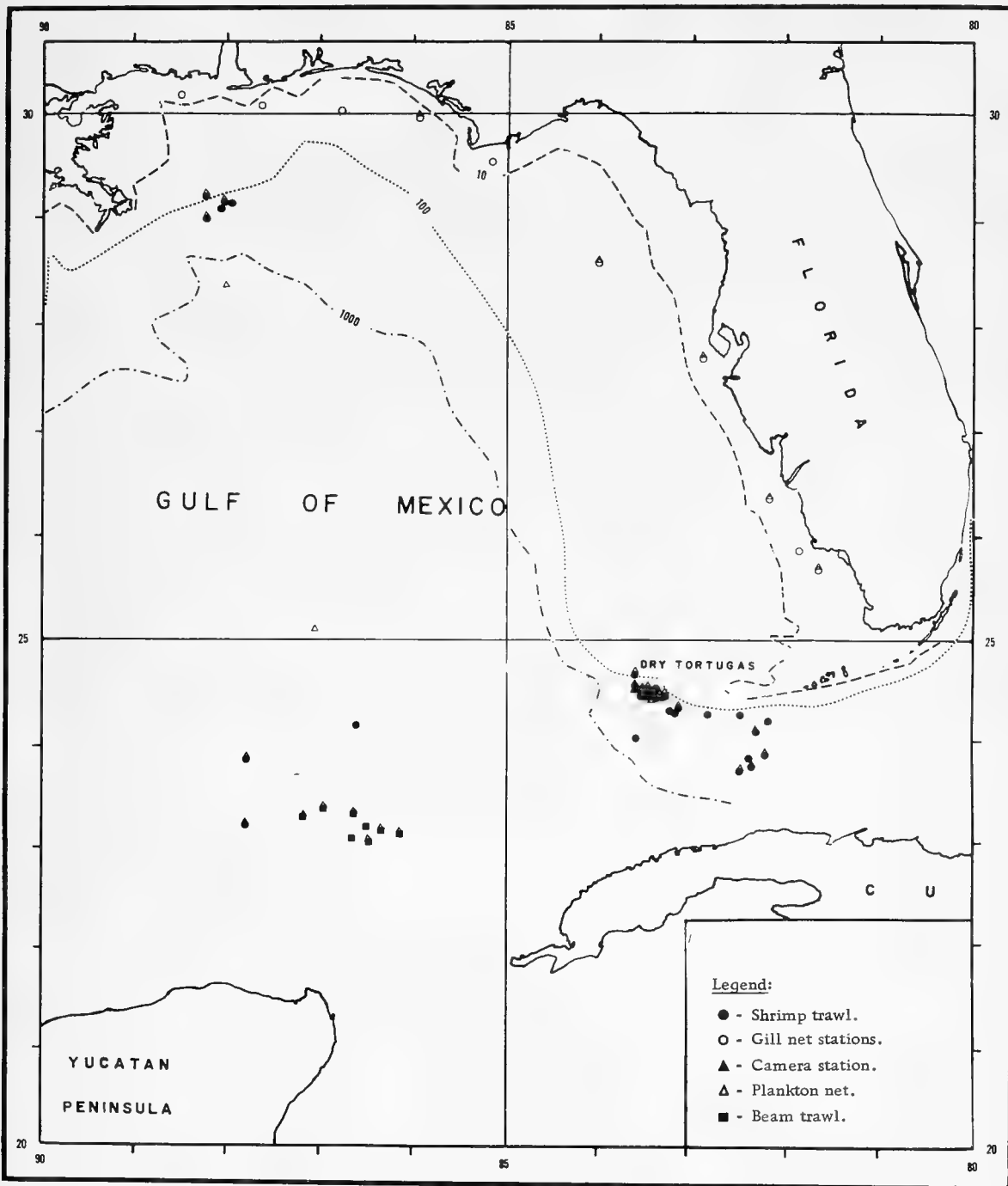
M/V "Oregon" Cruise 88 (November 18-December 13, 1963): To obtain seasonal data on the availability of royal-red shrimp (Hymenopenaeus robustus) in the Tortugas area and to conduct deep-water faunal transects in the Florida Straits, off the northeast coast of Yucatan, and off the Mississippi River Delta, were the principal objectives of this 26-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon.

Shrimp catches were extremely light compared with previous efforts in the Tortugas area. A total of 28 drags yielded slightly over 1,200 pounds of shrimp (heads on) compared with some 5,000 pounds in 31 drags on the same grounds in August 1963. Previously established optimum bottom temperatures for royal-red shrimp fishing (49° - 51° F.) occurred over a more extensive depth range than usual--from 190 to 235 fathoms. Several hundred feet of still and movie film, exposed in the red shrimp depth range, will be studied closely for indications of lowered

shrimp density as well as for gear performance.

Faunal transects were conducted in the Florida Straits and on the northeastern slope

of Yucatan at 100 fathom intervals to 800 fathoms. A 10-foot beam trawl was used when bottom conditions were unsuitable for shrimp trawls. The scheduled transect off the Mississippi River Delta was only extended to 500



M/V Oregon Cruise 88 (November 18-December 13, 1963).

fathoms due to wire losses on the Yucatan slope. Rattail fishes (*Macrouridae*) predominated the transect catches; other faunal elements were represented by several rare specimens, especially along the Yucatan slope.

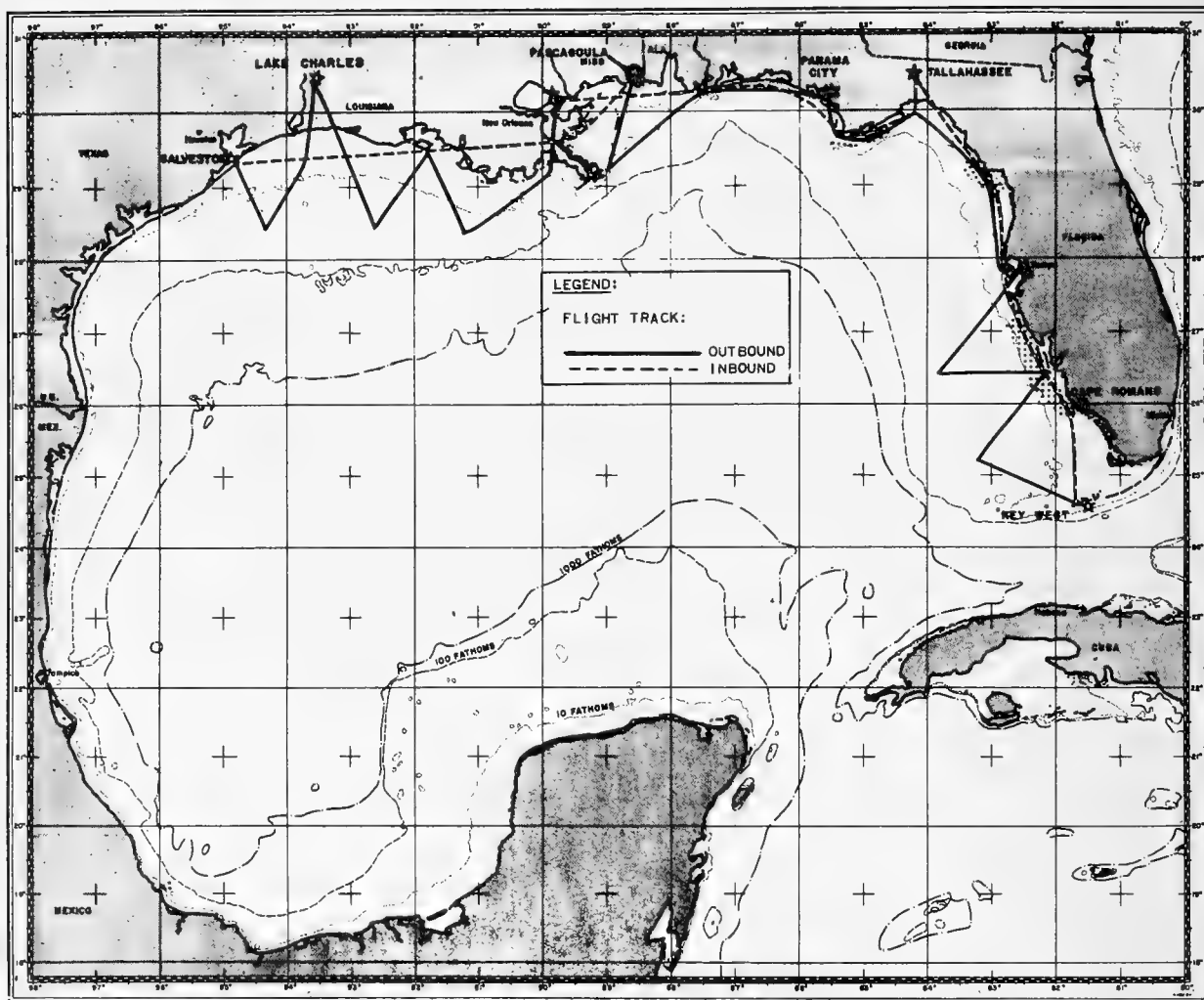
Preliminary investigations on off-season menhaden occurrence were initiated on this cruise in cooperation with the Bureau's Biological Laboratory at Beaufort. Gill-net sets (surface and bottom) were made at 10 localities, in depths between 4 and 62 fathoms off Mississippi, Alabama, and Florida. Menhaden (*Brevoortia patronus*) were taken in one bottom set off Horn Island Pass in $7\frac{1}{2}$ fathoms. Thirty-eight plankton tows were made for study by the Beaufort laboratory staff.

Note: See *Commercial Fisheries Review*, November 1963 p. 34.

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MENHADEN OFF-SEASON POPULATION SURVEY:

Airplane Spotting Flight 1 (November 19-22, 1963): To determine the occurrence of adult menhaden and related species in the Gulf of Mexico during the off-season period from November through April, the first of six monthly aerial observation flights was initiated in late November 1963 by the U.S. Bureau of Commercial Fisheries chartered airplane Apache N2229P. The search zone is from the Florida Keys to Galveston, Tex. The waters being canvassed generally extend from the shoreline to the 20-fathom curve. But in some areas off Alabama and Louisiana, coastal observations will be extended out to the 50-fathom curve.



Menhaden airplane spotting Flight No. 1.

During the initial flight heavy seas off Mississippi, Louisiana, Texas, and the west coast of Florida limited the effectiveness of aerial observations. In addition, low ceilings and overcast skies interfered with observations between Galveston and the Mississippi River Delta on November 22.

Surface menhaden schools were sighted in three areas off the Florida coast. In the Apalachicola area, 31 schools were observed, ranging in estimated size from 1 to 20 tons; although the majority were considered to be less than 10 tons. In waters west, southwest, and south of Cedar Keys, 16 schools were sighted. Those schools were estimated to be less than 10 tons each. In the area off Venice and southward to Cape Romano, 36 schools were observed; 3 of the schools were within 1 mile of the shoreline and the others ranged offshore as far as 12 miles, with the majority in the 2- to 4-mile zone. Most of those schools were estimated to be in the 10- to 15-ton category, but 2 schools 3 miles northwest of Naples and 2 schools 5 miles southwest of Venice, showed distinctive reddish color and were estimated to contain from 25 to 50 tons each.

In all three areas in which fish schools were observed, sea conditions were good and birds were present.

United States shrimp and snapper vessels were seen fishing off Florida. Shrimp vessels were also seen in Louisiana and Texas waters. No foreign fishing vessels were observed.

An infrared radiation thermometer to record surface water temperatures will be installed aboard the plane and used during future flights.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-11 (November 20-December 2, 1963): Catches of brown and white shrimp were light to moderate during this cruise off the coast of Louisiana and Texas by the chartered research vessel Gus III. The vessel (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries) was engaged in a continuing study of the distribution of shrimp in

the Gulf of Mexico. Eight statistical areas (13, 14, 16, 17, 18, 19, 20, and 21) were covered. One 3-hour tow with a 45-foot shrimp trawl was made in each of 3 depth ranges (0-10, 10-20, and over 20 fathoms) in those areas.

The best catches off Louisiana were taken in the vicinity of the Mississippi Delta which yielded 73 pounds of 26-30 count white shrimp from under 10 fathoms and 37 pounds of 21-25 count brown shrimp from over 20 fathoms. Moving westward, area 14 yielded 28 pounds of 31-40 count white shrimp from under 10 fathoms, 15 pounds of 21-25 count brown shrimp from the 10-20 fathom depth, and 11 pounds of 15-20 count brown shrimp from over 20 fathoms; area 16 produced 17 pounds of 15-20 count brown shrimp from over 20 fathoms.

The best catches off Texas were made in area 18 which yielded 24 pounds of 31-40 count white shrimp from under 10 fathoms, 14 pounds of 26-30 count brown shrimp from 10-20 fathoms, and 56 pounds of 12-15 count brown shrimp from over 20 fathoms.

Area 19 produced 39 pounds of 15-20 count brown shrimp from the 10-20 fathom range. Tows in area 20 took 10 pounds of 31-40 count white shrimp from the under 10-fathom depth, 19 pounds of 21-25 count brown shrimp from the 10-20 fathom range, and 29 pounds of 15-20 count brown shrimp from over 20 fathoms. Area 21 yielded 11 pounds of 26-30 count white shrimp from under 10 fathoms and 15 pounds of 15-20 count brown shrimp from 10-20 fathoms.

Catches of white shrimp were almost entirely limited to the under 10 fathom depth. The catch of pink shrimp did not exceed one pound at any station during the cruise.

* * * * *

M/V "Gus III" Cruise GUS-12 (December 10-22, 1963): Bad weather hampered operations of the chartered research vessel Gus III during this cruise off the Alabama coast extending westward off the coast of Texas. A total of ten statistical areas (10, 11, 13, 14, 16, 17, 18, 19, 20, and 21) were covered and one 3-hour tow with a 45-foot shrimp trawl was made in the three depth ranges of each area. Despite adverse weather conditions all stations were fished. Catches were generally spotty but good white shrimp catches

of up to 40 pounds were made in the 0-10 fathom depth of areas 13, 14, and 16. The largest haul of 40 pounds of white shrimp (26-30 count) from that depth range was from area 13 which also yielded 32 pounds of 21-25 count brown shrimp from over 20 fathoms.

Area 16 yielded 38 pounds of 15-20 count brown shrimp from the 10-20 fathom depth and there were relatively good catches of the same size shrimp in over 20 fathoms of areas 14 and 20.

Area 11 off the Mississippi coast yielded 33 pounds of large shrimp ranging from 15 to 25 count from the over 20-fathom depth divided about equally between the brown and white species. Catches from the other two depths in that area were negligible.

A catch of about 20 pounds from up to 10 fathoms in area 10 off the coast of Alabama was largely 21-25 count white shrimp. Each tow in the other two depth ranges of that area yielded less than one pound of brown and pink shrimp.

This was the last cruise of this series by the *Gus III*. A slightly different pattern will be fished in 1964.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See *Commercial Fisheries Review*, January 1964 p. 13.



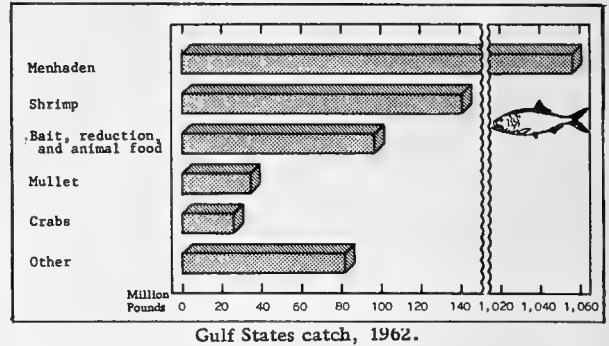
Gulf States

FISHERIES LANDINGS, 1962:

Fish and shellfish landings during 1962 in the Gulf States (west coast of Florida, Alabama, Mississippi, Louisiana, and Texas) reached an alltime high of over 1.4 billion pounds valued at a record \$94.5 million ex-vessel. This was an increase of 60.3 million pounds (4 percent) and \$19 million (25 percent) as compared with 1961.

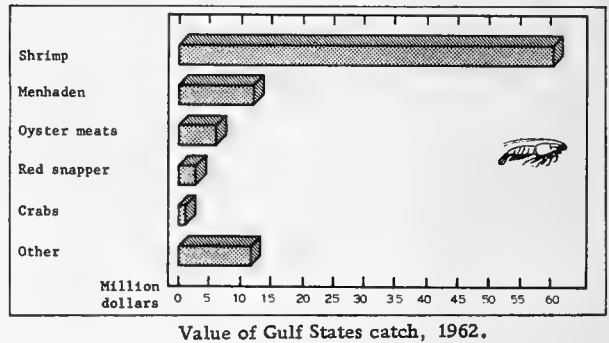
The gain in quantity over 1961 was due principally to record menhaden landings of 1.1 billion pounds (up 36 million); improved shrimp production totaling 142 million pounds (up nearly 8 million); and a 97-million-pound catch of unclassified fish for use as bait, reduction, and animal food (up 18.5 million). There was also some improvement in landings of Spanish mackerel, groupers, oysters, and mullet. However, compared with 1961,

there were notable reductions in landings of blue crabs, catfish and bullheads, black drum, and red snapper.



The value increase resulted chiefly from larger catches of high-priced shrimp. There were also moderate gains in the value of menhaden and oysters.

Three States (Louisiana, Mississippi, and Texas) accounted for 1.3 billion pounds or 91 percent of the total quantity; while Texas, Louisiana, and the west coast of Florida accounted for \$84 million or 89 percent of the value.



There were 23,212 fishermen engaged in the Gulf fishery in 1962. Commercial fishing craft operating in those States during the year consisted of 3,219 vessels of 5 net tons and over, 9,639 motor boats, and 638 other boats.

Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-NOVEMBER 1963:

Skipjack tuna landings in Hawaii in November 1963 were about 280,00 pounds, 35,000

pounds below the 1948-62 average for the month. The cumulative total catch for January-November 1963 was 8,045,000 pounds, or 1,592,000 pounds below the 1948-62 average for the same period.

During November there were 71 productive trips, giving an average of 2,665 pounds per productive trip. Individual catches ranged from 121 pounds to 9,827 pounds.

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COMMERCIAL FISHERY LANDINGS, JULY-JUNE 1962/63 AND 1961/62:

The commercial fish landings of the State of Hawaii during the 1962/63 fiscal year (July-June) totaled 10,879,389 pounds, valued at \$2,566,045 ex-vessel. Compared with the 1961/62 fiscal year, the State landings decreased 3,051,782 pounds or 21.9 percent, and the ex-vessel value decreased \$307,229 or 10.7 percent. The drop in weight and value of the 1962/63 landings was due primarily to the skipjack (*Katsuwonus pelamis*) landings which declined 3,262,717 pounds or 31.6 percent in weight and \$326,118 or 25.9 percent in value.

| Species | July-June 1962/63 | | July-June 1961/62 | |
|----------------------------------|------------------------|------------------|------------------------|------------------|
| | Quantity 1,000 Lbs. | Value \$1,000 | Quantity 1,000 Lbs. | Value \$1,000 |
| Ocean Catch: | | | | |
| Amberjack | 97 | 28 | 69 | 21 |
| Big-Eyed Scad | 173 | 123 | 244 | 165 |
| Creskies | 77 | 34 | 76 | 33 |
| Dolphin | 129 | 51 | 109 | 47 |
| Goatfishes | | | | |
| Weke-ua, Weke Moelua | 115 | 62 | 111 | 59 |
| Moano Kumu, Malu | 437 | 139 | 221 | 89 |
| Mackerel scad | | | | |
| Snappers: | | | | |
| Gray | 66 | 27 | 56 | 22 |
| Pink | 127 | 63 | 123 | 29 |
| Red | | | | |
| Opakapaka, Kalekale | 113 | 75 | 68 | 60 |
| Uiaula Koae, or Onaga | | | | |
| Uiaula or Ehu | | | | |
| Swordfish, Spearfish, & Marlin | 498 | 139 | 579 | 151 |
| Aua & Tunatke (Ahae): | | | | |
| Albacore | 18 | 4 | 16 | 5 |
| Big-Eyed | 1,175 | 573 | 1,182 | 579 |
| Yellowfin | 449 | 156 | 385 | 142 |
| Skipjack | 7,057 | 935 | 10,319 | 1,261 |
| Bonito or little tuna | 34 | 6 | 3 | 1/ |
| Kawakawa | | | | |
| Shellfish: | | | | |
| Crabs | 24 | 14 | 34 | 23 |
| Limpet | 19 | 10 | 7 | 4 |
| Lobster, spiny | 8 | 5 | 10 | 7 |
| Octopus | 5 | 3 | 3 | 2 |
| Squid | 12 | 3 | 8 | 4 |
| Other fish & shellfish | 203 | 84 | 246 | 92 |
| Total Ocean Catch | 10,836 | 2,534 | 13,870 | 2,825 |
| Pond Catch | 43 | 32 | 61 | 48 |
| Grand Total | 10,879 | 2,566 | 13,931 | 2,873 |
| Value Ex \$5.00 | | | | |

Other important species that showed decreased landings in 1962/63 were the Pacific blue marlin (*Makaira ampla*), 69,537 pounds or 27.1 percent; and the big-eyed scad (*Trachurus crumenophthalmus*), down by 71,543 pounds or 29.3 percent.

Landings of two species in 1962/63 that increased substantially were the yellowfin tuna (*Neothunnus macropterus*) and the mackerel scad (*Decapterus pinnulatus*). The in-

crease for the yellowfin tuna amounted to 64,497 pounds or 16.8 percent and that for mackerel scad amounted to 215,715 pounds or 97.5 percent.

| Island | Sea Catch | | Pond Catch | | Total Catch | |
|--------------|------------------------|------------------|------------------------|------------------|------------------------|------------------|
| | Quantity 1,000 Lbs. | Value \$1,000 | Quantity 1,000 Lbs. | Value \$1,000 | Quantity 1,000 Lbs. | Value \$1,000 |
| Hawaii | 1,466 | 354 | - | - | 1,466 | 354 |
| Maui | 1,101 | 159 | - | - | 1,101 | 159 |
| Lanai | 20 | 7 | - | - | 20 | 7 |
| Molokai | 8 | 6 | 8 | 4 | 16 | 11 |
| Oahu | 8,022 | 1,916 | 35 | 27 | 8,057 | 1,944 |
| Kauai | 219 | 91 | - | - | 219 | 91 |
| Total | 10,836 | 2,534 | 43 | 32 | 10,879 | 2,566 |

The Island of Oahu in the fiscal year ending June 30, 1963, accounted for 8,059,000 million pounds (valued at \$2,566,000) or about 74.1 percent of the quantity and 75.8 percent of the value. The Island of Hawaii was the second most important in landings and value and accounted for about 13.5 percent of the total landings and 13.8 percent of the value.

| Month | Sea Catch | | Pond Catch | | Total Catch | |
|--------------|------------------------|------------------|------------------------|------------------|------------------------|------------------|
| | Quantity 1,000 Lbs. | Value \$1,000 | Quantity 1,000 Lbs. | Value \$1,000 | Quantity 1,000 Lbs. | Value \$1,000 |
| 1962 | | | | | | |
| July | 2,072 | 314 | 5 | 4 | 2,078 | 318 |
| August | 1,200 | 229 | 5 | 4 | 1,205 | 233 |
| September | 852 | 192 | 5 | 3 | 857 | 195 |
| October | 894 | 214 | 3 | 3 | 897 | 216 |
| November | 521 | 184 | 4 | 3 | 525 | 187 |
| December | 810 | 264 | 5 | 5 | 815 | 269 |
| 1963 | | | | | | |
| January | 446 | 125 | 5 | 4 | 451 | 129 |
| February | 645 | 183 | 2 | 1 | 648 | 185 |
| March | 563 | 175 | 2 | 1 | 565 | 176 |
| April | 484 | 175 | 2 | 1 | 486 | 176 |
| May | 891 | 212 | 1 | 1 | 892 | 213 |
| June | 1,459 | 268 | 2 | 1 | 1,461 | 269 |
| Total | 10,837 | 2,535 | 43 | 31 | 10,880 | 2,566 |

Note: Due to rounding, totals in Table 2 and 3 do not agree in some cases.

The only other Island of the six reporting commercial fishery landings of more than 1 million pounds was Maui.

Landings in July made up about 19.1 percent of the 1962/63 fiscal year's landings and, as in past years, the peak season for the skipjack fishery (June-September) accounted for about 51.5 percent of total landings. (Department of Land and Natural Resources, Honolulu, November 20, 1963.)

Note: See Commercial Fisheries Review, January 1963 p. 33.



Industrial Fishery Products

TRENDS IN USE OF FISH MEAL IN MAINE AND MASSACHUSETTS:

Animal feed manufacturers and experiment station scientists in Maine and Massachusetts, fish reduction plants in Maine, and a feed mill in New Hampshire were visited in December 1963, by the Chief of the U. S. Bureau of Commercial Fisheries Technical Advisory Unit and the Animal Nutritionist attached to the Unit. Observations made during the trip were as follows:

The State of Maine is among the 10 leading states in the production of broilers and therefore is a relatively large consumer of fish meal. On the other hand, swine, which like poultry, consume fish meal, are reared in relatively small numbers, and there appears to be an opportunity in that State for an increase in pork production. Only half the eggs consumed in Massachusetts are produced in that State; this offers poultrymen an opportunity for expansion. These possible increases in poultry and swine production obviously would work to the advantage of fish meal producers by increasing the total consumption of fish meal.

The average levels of fish meal utilization in northeastern broiler, layer replacement, and laying rations appear to be about the same as those in the Southeastern States, namely, 2.5 percent in rations for broilers and chicks reared as layer replacements and 0.5 percent in laying rations. This is true despite the fact that fish meal is produced in the area. However, the level of utilization may be influenced by the fact that it has been necessary to import fish meal from abroad in order to supply the demand, and, as is true in the southeast, the necessity of using imported meal tends to depress the level of utilization.

Almost without exception, the animal nutritionists expressed high regard for fish meal. In the opinion of one nutritionist employed by a large concern, there is, without doubt, no other product available having as much potential as a balanced source of amino acids as has fish meal; this appears to be the opinion of most poultry nutritionists. Some of the feed manufacturers stated that they would prefer bulk shipments to sacked shipments of fish meal.

Most animal nutritionists and laboratory directors expressed lively interest in any advances that can be made in determinations of protein quality of fish meal. One concern is carrying out active research to determine to what extent enzymatic digestibility tests can be relied upon in comparison with the much more time-consuming chick or rat tests. Another feed mill depends upon chemical tests to tell whether or not there is a great deal of variation between different shipments of meal from a given source.

A poultry nutritionist at the University of Maine has recently completed some experiments in which fish meal significantly stimulated growth of layer flock replacement chicks during the first 9 weeks following hatching. Also, a Maine professor said that a number of egg producers in his State are building their own feed mills. Operators of these mills, in an effort to decrease the variety of feed ingredients that must be stored, have been exploring the possibility of eliminating fish meal and some other feed ingredients from their formulas. The Maine professor, who had been consulted concerning the proposed formula simplification, indicated that the elimination of fish meal from poultry feed formulas would be highly inadvisable, in his opinion, because it would mean the lowering of the quality of the rations.

At the University of Massachusetts, some very basic experiments on the endocrinology of fowl are being carried out. Such studies usually lead to a better understanding of physiology and, eventually, to increased economy and profits.

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UPWARD TREND IN USE OF FISH MEAL IN SOUTHERN STATES:

Mixed animal feed manufacturers and experiment station scientists in Alabama, Georgia, Mississippi, and Louisiana were visited during mid-November 1963 by the Chief of the U. S. Bureau of Commercial Fisheries Technical Advisory Unit and the animal nutritionist attached to the Unit. Fish reduction plants in Mississippi and Louisiana also were visited. The observations and conclusions resulting from the trip were as follows:

Interacting factors are discernible, in the area visited, that tend on the one hand to encourage and on the other to discourage liberal use of fish meal in poultry rations. A factor encouraging more liberal utilization has been the feed-ingredient price structure. During November 1963, relative prices of feed ingredients encouraged a trend toward relatively liberal utilization of fish meal. This trend was exemplified by commercial broiler rations that contained 6, 8, and even 10 percent fish meal. In general, such rations are formulated on a "maximum profit" basis, i.e., the cost per pound of feed is disregarded and the feed is formulated to produce a maximum of broiler meat per dollar invested in feed.

A number of factors tend to depress the level of fish meal utilization. One such factor is the result of competition between firms to produce rations of given quality to be sold at competitive prices. In order to reduce costs, formulators may substitute less expensive protein concentrates for part of the fish meal of a ration. Such concentrates are likely to be inferior to fish meal because of lower coefficients of digestibility, less desirable balance of essential amino acids, and lower content of the essential amino acids methionine and lysine. In addition, most protein concentrates other than fish meal lack the unidentified growth factor (UGF) of fish. Thus, as most formulators freely acknowledge, a reduction in the level of fish meal to lower the sale price of the feed mixture usually results in a somewhat less desirable ration.

A second factor tending to discourage liberal use of fish meal is the present unavailability of domestic meal. Of the feed mixers visited, most either had exhausted their supplies of domestic fish meal or were rapidly depleting their remaining stores. Many feed producers expressed a definite reluctance to use imported meal in liberal amounts. This reluctance is based upon what feed mill operators appear to believe is the extreme variability in the quality of imported meal. For example, according to one feed mill operator, in amounts no larger than a carload lot, sacks of meal have been found that appear to have originated in six different reduction plants, and variations in quality within such carload lots are, as one would expect, considerable.

According to an industrial nutritionist, a third factor historical in nature has tended to depress fish meal utilization in broiler rations in the Southern States. The nutritionist said that when the broiler-producing industry first got its start, rations ordinarily consisted of such suitable grain products as were readily available, plus a protein-mineral-vitamin mixture purchased from one of the firms specializing in such "premixes." The latter ordinarily contain fish meal in amounts too small to represent a liberal supply of fish meal in the finished ration. Fish meal utilization subsequently has tended to follow the levels established earlier by feed producers using premixes.

As a result of the interplay of factors, just described, the average fish meal content of broiler rations produced in the Southern States appears to be about 2.5 percent. This estimate is based upon information given both by experiment station specialists and by industrial nutritionists. Even though the average utilization level is relatively low percentage-wise, very large amounts of fish meal are utilized in the Southern broiler-producing States because of the tremendous poultry production in that region.

The evidence collected on this trip, and earlier, suggests that the demand for fish meal will continue to increase in the

Southern broiler-producing States but that the rate of increase cannot be expected to be rapid.

Several industrial nutritionists expressed some concern with present methods of quality control of fish meal, pointing out, as have many others in the past, that biological (chick and rat) tests are too protracted to yield the desired data before the feed mixtures containing the protein being tested have been sold and perhaps consumed. The need for a rapid test for quality is apparent. One nutritionist pointed out that microscopic examination of fish meal by a skilled technician reveals a great deal concerning the quality of the meal, as for example, whether or not even slight scorching has taken place.

Broiler production is still on the increase in the Southern broiler-producing States, but such increase is taking place at a decelerating rate. In contrast with this decline in rate of increase in broiler production, a marked increase in egg production is now taking place. Some new egg production units are of 1-million hen size and a few are even larger. This increase in egg production will add to the demand for fish meal for the reason that laying mashers usually contain some fish meal and rations for layer replacement flocks ordinarily contain relatively liberal amounts of such meal.

The production of dogfood and other petfoods seems to be increasing in the states visited. A large portion of the output of some large concerns now consists of petfoods. Because fish meal is used in low concentrations in some of these petfoods, this expanding branch of the mixed feed industry can be expected to have a limited but positive influence on the demand for fish meal. (U. S. Bureau of Commercial Fisheries, Technical Advisory Unit, Boston, Mass., December 16, 1963.)

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U. S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, November 1963: Preliminary data on U. S. production of fish meal, oil, and solubles for November 1963 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

| Area | Meal | Oil | Solubles | Homogenized ^{3/} |
|----------------------------------|------------|--------------|----------------------|---------------------------|
| | Short Tons | 1,000 Pounds | . . (Short Tons) . . | |
| November 1963: | | | | |
| East & Gulf Coasts . | 9,537 | 9,283 | 3,520 | - |
| West Coast ^{2/} | 2,447 | 1,026 | 1,084 | - |
| Total | 11,984 | 10,309 | 4,604 | - |
| Jan.-Nov. 1963 | | | | |
| Total | 221,654 | 178,273 | 88,514 | 7,216 |
| Jan.-Nov. 1962 | | | | |
| Total | 295,730 | 255,129 | 111,532 | 10,964 |

^{1/}Does not include crab meal, shrimp meal, and liver oils.
^{2/}Includes American Samoa and Puerto Rico.
^{3/}Includes condensed fish.
 Note: Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

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Major Indicators for U. S. Supply, November 1963: United States production of fish

meal and fish oil in November 1963 was higher by 17.8 and 24.9 percent, respectively, as compared with November 1962. Fish solubles production was down 4.5 percent.

| Item and Period | 1963 | 1962 | 1961 | 1960 | 1959 |
|----------------------------------|------------|---------|---------|---------|---------|
| (Short Tons) | | | | | |
| Fish Meal: | | | | | |
| Production 1/: | | | | | |
| December | - | 2,683 | 12,763 | 9,178 | 15,378 |
| November | 2/ 11,984 | 10,175 | 10,071 | 10,805 | 11,840 |
| Jan.-Oct. | 2/ 209,670 | 285,555 | 268,503 | 250,360 | 255,026 |
| Jan.-Dec. | - | 311,232 | 311,265 | 290,137 | 306,551 |
| Imports: | | | | | |
| December | - | 18,977 | 23,268 | 15,564 | 5,538 |
| November | - | 11,904 | 25,649 | 6,149 | 3,673 |
| Jan.-Oct. | 335,259 | 221,426 | 168,565 | 109,848 | 124,464 |
| Jan.-Dec. | - | 252,307 | 217,845 | 131,561 | 133,955 |
| Fish Solubles 3/: | | | | | |
| Production: | | | | | |
| December | - | 1,838 | 4,936 | 2,897 | 5,429 |
| November | 2/ 4,604 | 4,819 | 5,140 | 3,524 | 4,628 |
| Jan.-Oct. | 2/ 91,126 | 117,677 | 102,165 | 92,508 | 155,302 |
| Jan.-Dec. | - | 124,334 | 112,241 | 98,929 | 165,359 |
| Imports: | | | | | |
| December | - | 387 | 472 | 60 | 420 |
| November | - | 435 | 3,649 | 282 | 3,089 |
| Jan.-Oct. | 3,442 | 5,486 | 2,618 | 2,832 | 23,121 |
| Jan.-Dec. | - | 6,308 | 6,739 | 3,174 | 26,630 |
| Fish Oils: | | | | | |
| Production: | | | | | |
| December | - | 679 | 11,562 | 7,981 | 14,094 |
| November | 2/ 10,309 | 8,254 | 10,599 | 12,464 | 9,416 |
| Jan.-Oct. | 2/ 167,964 | 246,875 | 244,507 | 195,209 | 169,814 |
| Jan.-Dec. | - | 255,808 | 266,668 | 215,653 | 193,324 |
| Exports: | | | | | |
| December | - | 172 | 10,484 | 15,807 | 19,586 |
| November | - | 171 | 1,425 | 14,640 | 6,096 |
| Jan.-Oct. | 228,934 | 122,707 | 110,575 | 113,229 | 118,801 |
| Jan.-Dec. | - | 123,050 | 122,486 | 143,659 | 144,481 |

^{1/}Does not include crab meal, shrimp, and misc. meals.
^{2/}Preliminary data for 1963 based on reports which accounted for the following percentage of production in 1962: Fish meal, 93 percent; solubles and homogenized fish, 97 percent, and fish oil, 75 percent.
^{3/}Includes homogenized fish.
^{4/}Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.
 Note: Data for 1963 are preliminary.

* * * * *

Production, October 1963: During October 1963, 15,608 tons of fish meal and 14.2 million pounds of oil were produced in the United States. Compared with October 1962, this was a decrease of 20,357 tons or 57 percent in meal production, and 24.8 million pounds or 64 percent in oil production.

Menhaden meal production for October amounted to 11,420 tons--a decrease of 20,708 tons or 64 percent. Menhaden oil (12.3 million pounds) was 25.7 million pounds or 68 percent less than in October 1962.

Fish solubles manufactured in October 1963 amounted to 6,678 tons. This was a decrease of 6,636 tons (approximately 50 percent) below the production of the same month in 1962. Menhaden solubles (4,494 tons) made up 67 percent of the October fish solubles production.

Fish meal production amounted to 209,670 tons during the first 10 months of 1963. This was a decrease of 75,885 tons or 27 percent. Oil production for the same period of 1963

amounted to 168.0 million pounds--a decrease of 78.9 million pounds. Production of fish solubles for the first 10 months of 1963 amounted to 83,902 tons--a decrease of 23,355 tons or 22 percent.

| U. S. Production of Fish Meal, Oil, and Solubles, October 1963 ^{1/} with Comparisons | | | | | |
|---|---------------|---------------|----------------|----------------|----------------|
| Product | October | | Jan.-Oct. | | Total 1962 |
| | 1/1963 | 1962 | 1/1963 | 1962 | |
| (Short Tons) | | | | | |
| Fish Meal and Scrap: | | | | | |
| Herring | 824 | 487 | 7,283 | 5,035 | 5,095 |
| Menhaden ^{2/} | 11,420 | 32,128 | 165,168 | 231,100 | 238,680 |
| Sardine, Pacific | 13 | 15 | 29 | 688 | 702 |
| Tuna and mackerel | 2,225 | 2,074 | 18,283 | 22,669 | 26,559 |
| Unclassified | 1,126 | 1,260 | 18,907 | 26,052 | 27,297 |
| Total | 15,608 | 35,965 | 209,670 | 285,555 | 298,333 |
| Shellfish, marine animal meal and scrap | 3/ | 3/ | 3/ | 3/ | 12,899 |
| Grand total meal and scrap | 3/ | 3/ | 3/ | 3/ | 311,232 |
| Fish Solubles: | | | | | |
| Menhaden | 4,494 | 10,738 | 68,422 | 82,198 | 84,885 |
| Other | 2,184 | 2,576 | 15,480 | 25,059 | 28,353 |
| Total | 6,678 | 13,314 | 83,902 | 107,257 | 113,238 |
| Homogenized condensed fish | - | 850 | 7,224 | 10,420 | 11,096 |
| (1,000 Pounds) | | | | | |
| Oil, Body: | | | | | |
| Herring | 345 | 295 | 5,261 | 5,054 | 5,255 |
| Menhaden ^{2/} | 12,268 | 37,931 | 150,498 | 230,134 | 237,815 |
| Sardine, Pacific | 4 | 2 | 6 | 166 | 167 |
| Tuna and mackerel | 1,155 | 516 | 4,850 | 4,357 | 5,175 |
| Other (including whale) | 398 | 246 | 7,349 | 7,164 | 7,396 |
| Total oil | 14,171 | 38,990 | 167,964 | 246,875 | 255,808 |

^{1/}Preliminary data.
^{2/}Includes a small quantity of thread herring.
^{3/}Not available on a monthly basis.

* * * * *

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-October 1963: Based on domestic production and imports, the United States available supply of fish meal for January-October 1963 amounted

| U. S. Supply of Fish Meal and Solubles, January-October 1963 with Comparisons | | | |
|---|----------------|----------------|----------------|
| Item | Jan.-Oct. | | Total 1962 |
| | 1/1963 | 1962 | |
| (Short Tons) | | | |
| Fish Meal and Scrap: | | | |
| Domestic production: | | | |
| Menhaden | 165,168 | 231,100 | 238,680 |
| Tuna and mackerel | 18,283 | 22,669 | 26,559 |
| Herring | 7,283 | 5,035 | 5,095 |
| Other | 18,936 | 26,751 | 40,898 |
| Total production | 209,670 | 285,555 | 311,232 |
| Imports: | | | |
| Canada | 43,735 | 37,488 | 42,806 |
| Peru | 256,433 | 164,573 | 186,249 |
| Chile | 23,197 | 8,255 | 9,247 |
| So. Africa Republic | 8,275 | 9,884 | 10,084 |
| Other countries | 3,619 | 1,226 | 3,921 |
| Total imports | 335,259 | 221,426 | 252,307 |
| Available fish meal supply | 544,929 | 506,981 | 563,539 |
| Fish Solubles: | | | |
| Domestic production ^{2/} | 91,126 | 117,677 | 124,334 |
| Imports: | | | |
| Canada | 1,753 | 1,236 | 1,335 |
| Iceland | 55 | 2,205 | 2,332 |
| So. Africa Republic | 191 | 1,442 | 1,717 |
| Other countries | 1,443 | 603 | 924 |
| Total imports | 3,442 | 5,486 | 6,308 |
| Available fish solubles supply | 94,568 | 123,163 | 130,642 |

^{1/}Preliminary.
^{2/}50-percent solids. Includes production of homogenized condensed fish.

to 544,929 short tons--37,948 tons (or 7.5 percent) more than during the same period in 1962. Domestic production was 75,885 tons (or 26.6 percent) less, but imports were 113,833 tons (or 51.4 percent) higher than in the same period in 1962. Peru continued to lead other countries with shipments of 256,433 tons.

The United States supply of fish solubles (including homogenized fish) during January-October 1963 amounted to 94,568 tons--a decrease of 23.2 percent as compared with the same period in 1962. Domestic production and imports dropped 22.6 percent and 37.3 percent, respectively.



Inventions

"BATHYKYMOGRAPH" MEASURES SPEED AND DEPTH OF NET WHILE FISHING:

A device known as a bathykymograph has been designed to measure how deep and how fast a net sinks while fishing. The information may help fishermen in placing their nets.

The bathykymograph is cylindrical, 12 inches long and 4 inches in diameter. The cylinder is equipped with a sealed piston and stylus. The device is attached to the net. As the capsule sinks, water pressure on the pis-



Frank J. Hester, the inventor, holds bathykymograph which can tell how fast and deep a fish net sinks.

ton compresses a spring which moves the stylus and a clock-like device, recording depth and time.

The bathykymograph has been patented by Frank J. Hester, 2033 Abbott Street, San Diego, Calif.

MULTI-IMMERSION QUICK FREEZER:

The inventor claims this is a quick-freezing process designed for enterprises having limited complementary facilities other than freezer storage. It is said to decrease the cost of operation by maintaining higher refrigeration efficiency and low energy load by freezing in stages with very simple devices. (Patent No. 3,078,687, SIC No. 3585, granted Willis R. Woolrich,

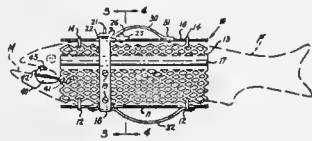
700 Texas Avenue, Austin 5, Texas.)

METHOD OF ATTACHING FISHING SINKERS:

The inventor claims this is a simple method of handling split-shot type weights and attaching them to a fishing line. It involves joining the weights together in a chain effect with a plastic ribbon, gummed paper tape, or integrally cast connectors. It is said that attachment of one or more of the weights is then simplified by their symmetric arrangement on the connector. (Patent No. 3,084,469, SIC No. 3949, granted Thomas H. Stratton, Box 454, State Farmers Market, Columbia, South Carolina.)

FISH HOLDER PATENTED:

A new device has been designed for grasping the body of live fish while removing hooks. The risk of hand injury from fins, scales, or spines is thereby avoided, according to the inventor. The device is adjustable in size and can be made of various corrosive-resistant materials. (Patent Number 3,081,576, granted Harry C. Collins, 11 West Third Street, Ocala, Florida.)



Irradiation Preservation

PRELIMINARY TESTS ON OILY FISH INDICATE FLAVOR AND STORAGE PROBLEMS:

Research on the irradiation of fish and fish products in the Seattle Laboratory of the U. S. Bureau of Commercial Fisheries have consisted primarily of the investigation of non-oily species such as sole and crab. During the Atomic Energy Commission contract year (July 1963-June 1964), a series of species of oily fish (either containing a high oil content or oil with a high degree of instability) are to be irradiated and their storage-keeping quality tested. Such fish as the various species of salmon, herring, sablefish, and some of the rockfishes will be included. The first species (pink salmon) tested has presented some very serious problems. Not only does rancidity limit the storage life of the irradiated samples to a shorter period than that of the unirradiated controls, but also the initial desirable, normal salmon flavor is largely destroyed by the irradiation process. It is obvious that considerable basic research will be necessary if satisfactory results are to be realized using irradiation as a tool for increased storage life of fish with high oil content.



Maryland

OYSTER STUDIES IN 1963 INDICATE FAVORABLE CONDITIONS FOR SPAWNING AND SETTING:

The late 1963 oyster spat in Maryland's tidewaters was generally light and ended by mid-September at all stations where test shells were exposed. This was earlier than usual, as evidenced by a number of years when fair sets were recorded as late as mid-October. Factors that contributed to the early end of setting were the lower than normal water temperatures that occurred during late summer and early fall and the completely spawned out condition of most oysters that had produced such excellent midsummer sets. At most stations water temperatures dropped below 70° F, shortly after mid-September, about three weeks earlier than normal.

A survey of the commercial or surviving set on all State plantings was conducted in late 1963 by the Tidewater Fisheries Depart-

ment survey vessel Tiny Lou with a biologist cooperating full time in making the observations. Excellent spat counts on bars in many areas confirmed the good sets whose potential had previously been indicated by the test shell bags.

In general, 1963 has produced one of the best oyster sets on record with high counts of spat particularly in the Eastern Chesapeake Bay area, lower Choptank tributaries, Little Choptank River, and St. Marys' River. An exceptionally heavy set was found in the upper Wicomico tributary of the Potomac River, the third such set recorded in the past 24 years with little or no set during intervening years.

The conditions needed to bring about a good oyster set result from a complicated combination of factors that are not all fully understood. However, certain features of 1963 that favored a good set in Maryland were: Weather during March was much warmer than normal and accompanied by copious rainfall. This started oysters feeding vigorously with an abundance of food early in the season. May was cooler than normal so that feeding conditions were excellent while the beginning of oyster spawning was delayed. The result was that oysters generally were exceptionally fat and in top condition by the beginning of June before spawning commenced.

Late spring and summer 1963 were marked by drought conditions and an absence of storms or strong winds. Salinity of the bay was much higher than normal and the lack of fresh water run-off retarded the formation of low oxygen conditions in deep water that are caused in part when a layer of fresher water floats near the surface. The spawning of oysters is known to be favored by the higher salinities, and two periods of sharp temperature rises occurred during the summer that would tend to trigger mass spawning. The above conditions favored production of an abundance of oyster larvae wherever brood stock was present.

Newly hatched oysters while in the 2-week swimming stage are microscopic and, though able to swim slowly up or down, are entirely at the mercy of water currents in their long distance movement. Since only a small percentage of the bottom is shell covered and suitable for setting it is not unusual for a large part or even all of a good brood of larvae to be swept away from the oyster beds and into deep channels or over unfavorable bottom where they will smother and be lost at

the time when setting must occur. Thus good broods of larvae often are observed in the water that become totally lost in storms before they can set. The relatively calm waters of last summer permitted a greater portion than usual of the oyster larvae to be retained in the creeks and bays where there were shell beds upon which they could set.

The flow of heavier salt water from the ocean along the Bay's bottom and the spinning of the earth tend to carry oyster larvae near the bottom upstream and swing them towards their right as they move up the channel. Thus concentrations of larvae can occur in the upper part of small tributaries or embayments where there is no strong downstream flow of fresh water. They also concentrate along the right hand bank, as you look upstream, of the Bay proper and of large tributaries such as the Potomac and James Rivers. This is one of the reasons why setting usually is higher along the eastern side of the Bay than along its western side.

A sustained flow of wind from one direction may produce currents that carry larvae into a given area and at the same time carry them away from another location so that ideal setting conditions do not occur in all places at the same time. That is one of the reasons why, even in a particularly good setting year, some areas failed to receive good sets.

Still another factor that can sharply reduce an oyster set is the presence or absence of oyster enemies such as the oyster drill or "screw borer." Oyster drills must have quite salty water and so are seldom a serious problem in Maryland except on the seaside and in the lower portions of Somerset County waters. There have now been several years that were drier than normal and this has permitted a strong build-up of the drill population in Tangier Sound and even up into the lower part of Fishing Bay, Hooper Straits and the lower Honga River. Each young drill can eat several young oyster spat per day so that many newly set spat never get big enough to be easily seen by the naked eye. The abundance of drills in 1963 in the Tangier Sound area was quite destructive and was a major factor in the sharp reduction in the surviving oyster set.



Oysters grew quite well during 1963 and there were no reports of serious oyster mortalities since the late 1963 winter. A survey showed that the fungus *Dermocystidium*, while favored by high salinity, was apparently checked by cooler water temperatures and though present in the lower part of the Maryland area, and in some instances found further upstream than usual, produced no serious problem where it had been monitored.

The parasite "MSX" has remained as a light infestation on certain bars in the Pocomoke and Tangier Sound areas. It is possible that the higher salinities may result in some increase of infection by this parasite with the extent of future damage somewhat dependent upon salinity conditions in 1964. The reports of much lower losses in 1963 from "MSX" in Delaware Bay and in the lower Chesapeake continue to be a most hopeful sign.

The condition of oyster meats was better in the fall of 1963 than in the fall of 1962. Oysters were generally fat on most bars except for a few localities. Water temperatures had fallen rapidly during the 1963 fall period to curtail fattening. Late fall 1963, temperatures were too low for effective feeding so that oyster condition is expected to decline slowly during the winter period of hibernation and not improve until warming in the spring of 1964.

A few reports of oysters that were poor and shucking out only a few pints were received. These were checked as of early December 1963 and no parasite had been found associated with the condition. One apparent cause of poor yields in pints per bushel was the rapid growth in 1963 that enabled many young oysters to reach legal size but with thin shells, long bills, and shallow cups. Especially when clustered, these thin flat oysters cannot yield many pints even when fairly fat. (Chesapeake Biological Laboratory, Solomons, Md., December 10, 1963.)



Michigan

STOCKS OF LAKE TROUT INCREASE DUE TO RESEARCH:

Latest studies give United States and Canadian conservation agencies another solid vote of confidence behind their joint efforts to control the parasitic sea lamprey and re-

build lake trout populations in the upper Great Lakes.

Good survival and growth among lake trout in Lake Superior continue as the result of lamprey control and fish plantings in recent years, according to reports made during the December 1963 meeting of the Great Lakes Fishery Commission in Ottawa, Canada. Also, catches of adult sea lamprey remained relatively low in 26 streams along the south shore of Lake Superior where electrical barriers are in operation.

Although up somewhat from 1962, the 1963 lamprey take is still 79 percent below the average catch of these eel-like predators during the 1957-61 period.

Barrier operations and commercial catches underline the combined effectiveness of lamprey control and fish plantings in Lake Michigan. Through September 1963, commercial operators had taken 26,000 pounds of lake trout in those waters, their highest total since 1949. A year earlier they had netted only 325 pounds from Lake Michigan.

Lamprey catches in 1963 declined 55 percent from 1962 in 2 of 3 Lake Michigan streams where barriers are in use. The reduction was recorded in the Bark and Sturgeon Rivers which were chemically treated. In the untreated Cedar river, there was a 12-percent jump in the number of lampreys captured.

Lake trout studies show a drop in the number of lamprey-scarred fish caught in Lake Superior. Too, they reveal a continued improvement in the average size of lake trout which has increased from 2.5 to 3.4 pounds during the last five years.

The U. S. Bureau of Commercial Fisheries reported that lake trout 29-32 inches long were more abundant in 1963; those in the 25-28-inch group made smaller gains. Fewer fish were available from 1962 to grow into the 21-24 inch category. Lake trout less than 21 inches long were more numerous in 1963, virtually all of them being hatchery fish.

As expected, hatchery-reared fish again accounted for a larger percent of lake trout catches in Michigan's Lake Superior waters. East of the Keweenaw Peninsula, hatchery fish made up almost 55 percent of the legal catch through September 1963 as compared

to only 1,2 percent in 1959. Among the under-sized fish, the hatchery figure climbed from less than 3 percent in 1959 to 94 percent in the fall of 1963.

In Wisconsin waters there also had been a marked increase in the abundance of juvenile lake trout in Lake Superior, due almost entirely to large plantings of hatchery fish.

Fisheries officials are particularly encouraged by signs of lake trout spawning in most areas along the Michigan shore of Lake Superior from Grand Marais westward. Last fall's spawning run was the largest since 1958 in Wisconsin's waters, and there is good reason to expect that 1964 will see another large increase of spawning fish in these and other parts of Lake Superior.

The lake trout restoration program is coordinated by the Great Lakes Fishery Commission. Federal, Canadian, and state agencies, including the Michigan Department of Conservation, are cooperating in the long-range effort. (Michigan Department of Conservation, Official News Bulletin, December 12, 1963.)



New England Fisheries

BOTTOMFISH AND SCALLOP LANDINGS IN 1963 AND FORECAST FOR 1964:

Changes in the abundance of groundfish on New England fishing banks are expected to be mixed during 1964, and the abundance of sea scallops will decline, according to the Acting Director of the North and Middle Atlantic Region of the U. S. Bureau of Commercial Fisheries. This forecast is based on information provided by biologists of the Bureau's Woods Hole Laboratory who monitor the landings of commercial fishermen, and study the population of fish and shellfish on offshore fishing banks by sampling with the Bureau's new fishing research vessel Albatross IV.

Haddock landings in New England in 1963 will be about 112 million pounds, a decline from the 117 million pounds landed during 1962. The stocks of haddock on New England banks are expected to remain in only fair supply during 1964, so landings in 1964 will not improve. The drop will be most noticeable in the scrod category because of the scarcity of small fish which has been due to the age groups spawned in 1960, 1961, and 1962 being below average in abundance.

However, things will be brighter in the haddock fishery after 1964. The survival of fish spawned in 1963 appears to have been unusually high. Both the summer and fall surveys of the offshore banks by the Albatross IV indicate the greatest abundance of young fish since the surveys were started in 1953. These young fish will reach marketable size and thus begin to be important to the fishery in the summer of 1965. This 1963 age group is expected to support the fishery for several years.

Landings of cod in 1963 will be slightly less than the 35 million pounds landed in 1962. There has been an upward

trend in cod landings during the past few years, and abundance in 1964 is expected to remain at a relatively high level. Surveys by the Albatross IV show a fairly strong age group spawned in 1963 which should enter the fishery in late 1964 and early 1965.

Landings of ocean perch in 1963 will be somewhat over 100 million pounds with abundance holding steady. There is some indication that there will be more fishing in the Gulf of St. Lawrence in 1964. If so, total United States landings in 1964 will exceed those of 1963.

Yellowtail flounder landings in 1963 will be nearly 75 million pounds, an all time high. This is due to increased abundance of fish which resulted from excellent survival of the age groups spawned in 1958, 1959, and 1960. The oldest of these age groups will be of less importance in 1964, and the following age group (1961) appears to be a poor one. Therefore, abundance and landings are expected to be lower in 1964, although still at a relatively high level.

United States landings of whiting (silver hake) in 1963 will total about 92 million pounds which is slightly less than the figure for 1962. The U.S.S.R. fleet probably removed an equal quantity of whiting from the area during the year. What effect the Russian fishing will have on the stocks of whiting cannot be determined at this time, according to Bureau biologists. Thus they are withholding any estimate of the availability of this species to United States fishermen during the year 1964. There is, however, no indication at present of any serious decline in abundance.

Sea scallops have suffered a decline in abundance during 1962 and 1963 although total landings by United States and Canadian fishermen did not slip much in 1963. United States vessels landed about 19.7 million pounds of scallop meats in 1963, which was 16 percent less than the 23.5 million pounds landed in 1962. Canadian landings, however, increased from 13.9 million pounds in 1962 to 16.4 million pounds in 1963. Research vessel surveys show that the downward trend in abundance is continuing and landings are expected to decrease again in 1964.



North Atlantic Fishery Investigations

GROUNDFISH DISTRIBUTION AND ABUNDANCE STUDIES:

M/V "Albatross IV" Cruise 63-7-2 (December 2-16, 1963): To determine the fall distribution and relative abundance of groundfish species from Georges Bank to Hudson Canyon and to study marine food and its availability to a number of groundfish species were the main objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

Around-the-clock fishing operations were conducted with a No. 36 trawl (lined). A total of 86 fishing and 2 hydrographic-plankton stations were occupied, 128 bathythermograph casts were made, and 300 sea-bed drifters were released. Otoliths were removed from 31 cod, scales were taken from 473 haddock and 1,190 yellowtail flounder, and 1,760 stomachs from many species were examined. Hy-

drographic and plankton data were collected. Temperature data were collected on a specific transect to compare with the temperature readings taken from an airplane with infrared equipment.

There were on the cruise two biologists from the Marine Fisheries Laboratory of the New Jersey Division of Fish and Game. Fluke and porgy are extremely important to New Jersey commercial and sport fishermen, and the present cruise provided an opportunity for cooperative work on the winter distribution of those two species.

Note: See Commercial Fisheries Review, Sept. 1963 p. 37.



North Atlantic Fisheries Exploration and Gear Research

TUNA DISTRIBUTION STUDIES IN NORTH ATLANTIC CONTINUED:

M/V "Delaware" Cruise 63-11 (November 13-25 and December 2-10, 1963): This exploratory long-line cruise continued seasonal coverage of the tuna populations in waters east of New England and south of Nova Scotia by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The objectives of the cruise were to: (1) investigate the distribution, abundance, and migration of tuna and swordfish; (2) evaluate the tuna and swordfish commercial fishing potential in the Northwest Atlantic; and (3) collect descriptive oceanographic data.

Previous pelagic long-line explorations in the Northwest Atlantic during November and December had been limited to the work of the Japanese exploratory fishing vessel Shoyo Maru in December 1959, and that of the Woods Hole Oceanographic Institution research vessel Crawford in November 1960.

New information was obtained by the Delaware during cruise 63-11. The known range of albacore (Thunnus alalunga), yellowfin (Thunnus albacares), big-eyed (Thunnus obesus), and skipjack (Katsuwonus pelamis) in the late fall season was extended north to 41° latitude and east to 60° longitude by a significant catch at station No. 4 (see table). The catch of 12 albacore on 420 hooks at Station No. 8 (2.9 fish per 100 hooks) proved to be the highest known catch rate for this species in the Northwest Atlantic. The conspicu-

ously small catch of bluefin tuna (Thunnus thynnus) suggested that this species had not moved into the oceanic (Gulf Stream front) area from continental slope waters.



Fig. 1 - Albacore tuna from a Delaware long-line set off New England on November 23, 1963.

Of the 12 long-line sets (3,570 hooks) completed during the cruise, 8 were daylight sets and 4 were night sets. Gear consisted of Japanese-type long-line (160 fathoms of mainline with 7 branchline assemblies per "basket"). Several "baskets" were modified to test new long-line gear components: polypropylene mainline and branchline, vinyl-covered galvanized wire leaders, and aluminum leader crimping ferrules. Floatline lengths were varied at 10, 20, and 30 fathoms to determine relationships of catch to depth and temperature. A minimum of four bathythermograph casts were made at each long-line station. Squid, herring, and mackerel were used to determine bait selectivity.

Seven temperature transects between stations provided thermal environmental data to assist in positioning long-line sets. The long-line set at Station No. 4 was of particular interest because of its position across a "thermal wall;" on the warm side, the catch pro-

Station Data and Catches for M/V Delaware Cruise 63-11

| Sta. No. | Date 1963 | Time | Position | | Gear & Set No. | No. of Hooks | Tuna | Sharks | Misc. Fish | Surf Temp. ° F. | Remarks 1 |
|----------|----------------|----------------|----------|--------|----------------|--------------|--------------------------------------|-----------------|---|-----------------|--|
| | | | Lat. | Long | | | | | | | |
| 1. | 11-15 | 0730-1445 | 42-02N | 64-06W | LL#1 | 420 | | 1 P | 2 LL, 2 SL | 52.7-53.0 | |
| 2. | 11-17 11-18 | 2150- -0815 | 42-00N | 62-45W | LL#2 DNNL | 210 | | | | 52.3-53.4 | |
| 3. | 11-20 | 0000-0200 | 41-28N | 60-12W | DNNL | | | | | 54.5 | |
| 4. | 11-20 | 0635-1410 | 41-14N | 59-56W | LL#3 | 420 | 5 A, 2 YF 1 BE, 1 SJ | 1 M | 4 LL | 55.4-69.6 | 1A - Lost |
| 5. | 11-21 | 0625-1355 | 40-39N | 62-16W | LL#4 | 420 | 1 A, 4 YF | 1 B | 1 LL, 1 LS | 69.3-71.9 | 3 YF - Tagged |
| 6. | 11-21 11-22 | 2150- -1050 | 41-00N | 62-48W | LL#5 DNNL | 210 | 6 BE | 3 M | 1 LL, 1 LF 2 SW | 59.7-60.9 | 5 BE - Tagged |
| 7. | 11-22 | 0645-1315 | 41-06N | 62-45W | LL#6 | 210 | 1 YF, 2 BE | 1 M | 1 LL | 50.4-59.9 | 1 YF - Tagged 2 BE - Tagged |
| 8. | 11-23 | 0625-1415 | 40-22N | 64-00W | LL#7 | 420 | 12 A, 6 YF 4 BE, 2 BF | 1M | 3 LL 1 Opah | 50.0-54.5 | 4 A - Tagged 4 YF - Tagged 2 BE - Tagged 2 BF - Tagged |
| 9. | 12- 5 | 0620-1420 | 40-15N | 64-12W | LL#8 | 420 | 6 A, 5 BE | 1 M | 1 LL | 51.5-64.1 | 1 A - Tagged 3 BE - Tagged 1 A - Lost 1 M - Tagged 1 A - Tagged |
| 10. | 12- 5 12- 6 | 2140- -1050 | 40-13N | 65-45W | LL#9 | 210 | 1 A | | 1 SW, 1 C 1 LF | 53.9-63.0 | |
| 11. | 12- 6 | 0700-1305 | 40-12N | 65-44W | LL#10 | 210 | | | 2 SL 1 Opah | 53.9-61.8 | |
| 12. | 12- 7 12- 8 | 2135- -1025 | 39-06N | 66-26W | LL#11 DNNL | 210 | 1 BE | 1 B, 1 M | | 62.5-63.0 | |
| 13. | 12- 8 | 0635-1235 | 39-07N | 66-30W | LL#12 | 210 | | | 1 SL, 1 R | 62.9-63.0 | |
| Totals | | | | | | 3,570 | 25 A, 13 YF, 19 BE, 2 BF, 1 SJ | 1 B, 8 M 1 P | 13 LL, 1 R 5 SL, 2 Opah 3 SW, 2 LF 1 C, 1 LS | | 6 A - Tagged 8 YF - Tagged 12 BE - Tagged 2 BF - Tagged 1 M - Tagged 2 A - Lost |

1/Fish tagged and released are included in the catch; fish lost at the rail are not included in the catch.
 Abbreviations: Gear: LL = Long line; DNNL = Dip net, Night light.
 Tuna: A = Albacore; BE = Big-eyed; BF = Bluefin; YF = Yellowfin; SJ = Skipjack.
 Sharks: B = Blue; M-Mako, P = Porbeagle.
 Misc. Fishes - LL = Long-nose lancetfish; SL = Short-nose lancetfish; SW = Swordfish; R = Pelagic ray; C = Centrolophus.sp.; LF = Lepidocybium flavobrunneum; LS = Longbill spearfish.

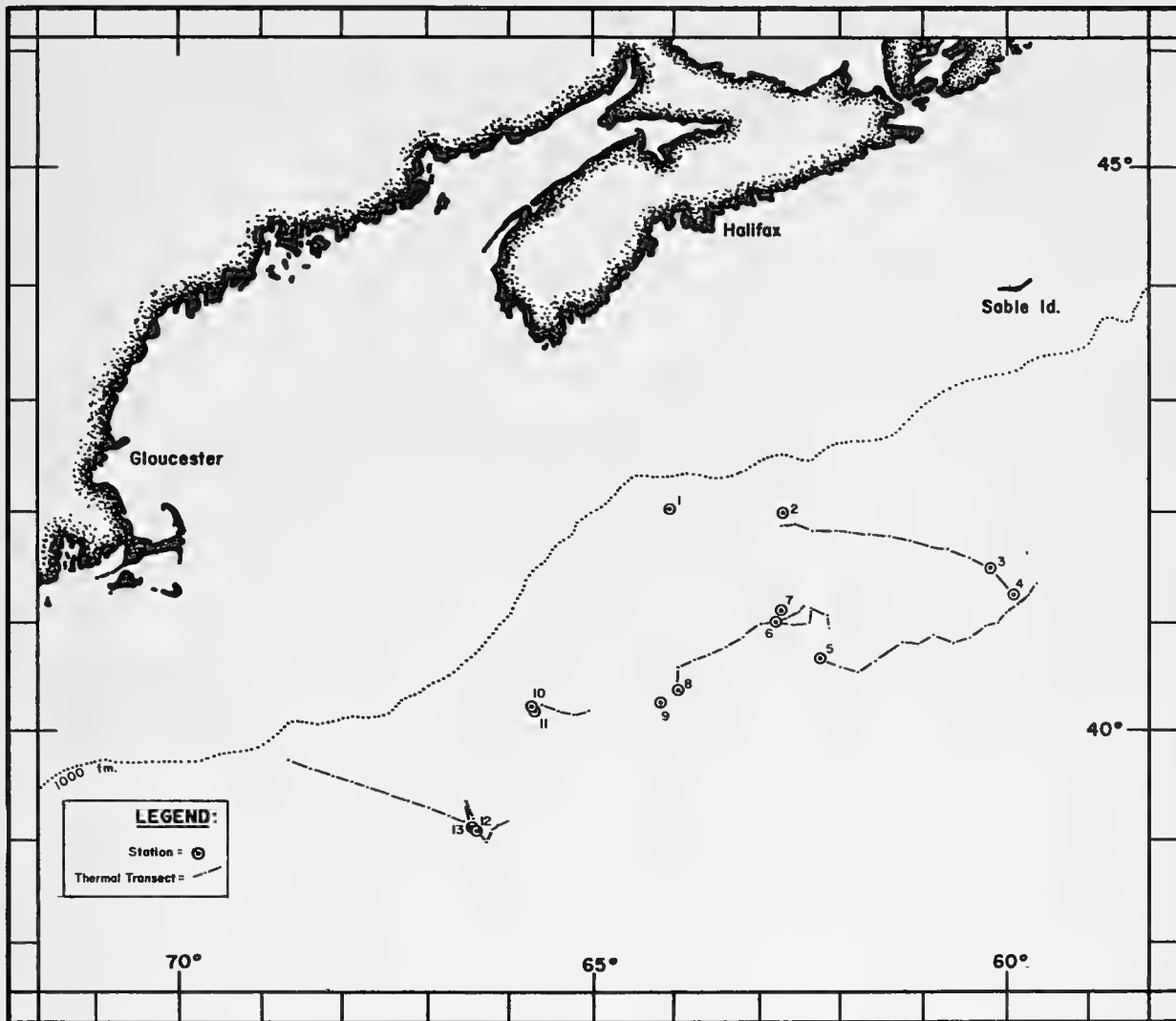


Fig. 2 - Area of operations during M/V Delaware Cruise 63-11, November 13-25, and December 2-10, 1963.

gressed from skipjack to albacore and yellowfin at the "wall," and ended with a single big-eyed tuna on the colder side of the "wall."

During the bait selectivity tests at station nos. 4, 5, 7, and 8, herring and squid baits were used on alternate "baskets." The albacore catch on herring was eight times that on the squid bait, and all yellowfin taken at those stations were caught on herring. Mackerel and squid were fished during night sets; the catch was too small to indicate a bait preference although two small swordfish (Xiphias gladius) (41 and 75 pounds) were caught on mackerel, while a 300-pound swordfish was taken with herring bait.

The average weight of the tuna in the catch were: albacore 31 pounds, big-eyed 60 pounds, yellowfin 52 pounds, bluefin 65 pounds, and skipjack 21 pounds. The only tuna that sustained shark damage was a 125-pound big-eyed. Fish that were not needed for additional study were tagged and released.

Aside from the tuna and swordfish catch, several other specimens of scientific interest were taken during the cruise, including the longbill spearfish (Tetraturus pfluegeri), 1 specimen; the gempylid (Lepidocybium flavo-brunneum), 2 specimens; the black ruff (Centrolophus niger), 1 specimen; and the pelagic stingray (Dasyatis violacea); 1 speci-

men. Other specimens of lesser note were 2 opahs (*Lampris regius*), 13 longnose lancetfishes (*Alepisaurus ferox*), 5 shortnose lancetfishes (*Alepisaurus brevirostris*), 1 blue shark (*Prionace glauca*), 8 mako sharks (*Isurus oxyrinchus*), and 1 porbeagle shark (*Lamna nasus*).

Note: See Commercial Fisheries Review, Aug. 1963 p. 36, and Feb. 1962 p. 1.



Oceanography

**AQUATIC RESEARCH INSTITUTE
ESTABLISHED AT STOCKTON, CALIFORNIA:**

The Aquatic Research Institute was established in 1962 as a non-profit, tax-exempt entity in Stockton, Calif. (see map page 41). The main concern of the Institute is the coastal area or estuarine zone of tropical Asia and temperate central California. Investigations in those widely separated areas are interre-

lated because the Sacramento-San Joaquin Delta region provides the only delta system in western America with conditions similar to those in Asia. The Asian program of the Institute is a continuation of the work of the formerly active George Vanderbilt Foundation. The scientific program of the Aquatic Research Institute is under the direction of Dr. Robert R. Rofen.

Sacramento-San Joaquin Delta: This region extends over about 738,000 acres in central California. It is located at the confluence of the Sacramento and San Joaquin Rivers and includes 700 miles of waterways which have a water surface covering 50,000 acres. The Delta embraces a variety of water environments, ranging from marine rocky shores to marsh areas. Tidal influence and brackish water extend as far east as Stockton.

The Delta supports many kinds of fish and wildlife. Salmon and steelhead pass through the Delta on their spawning migrations to up-

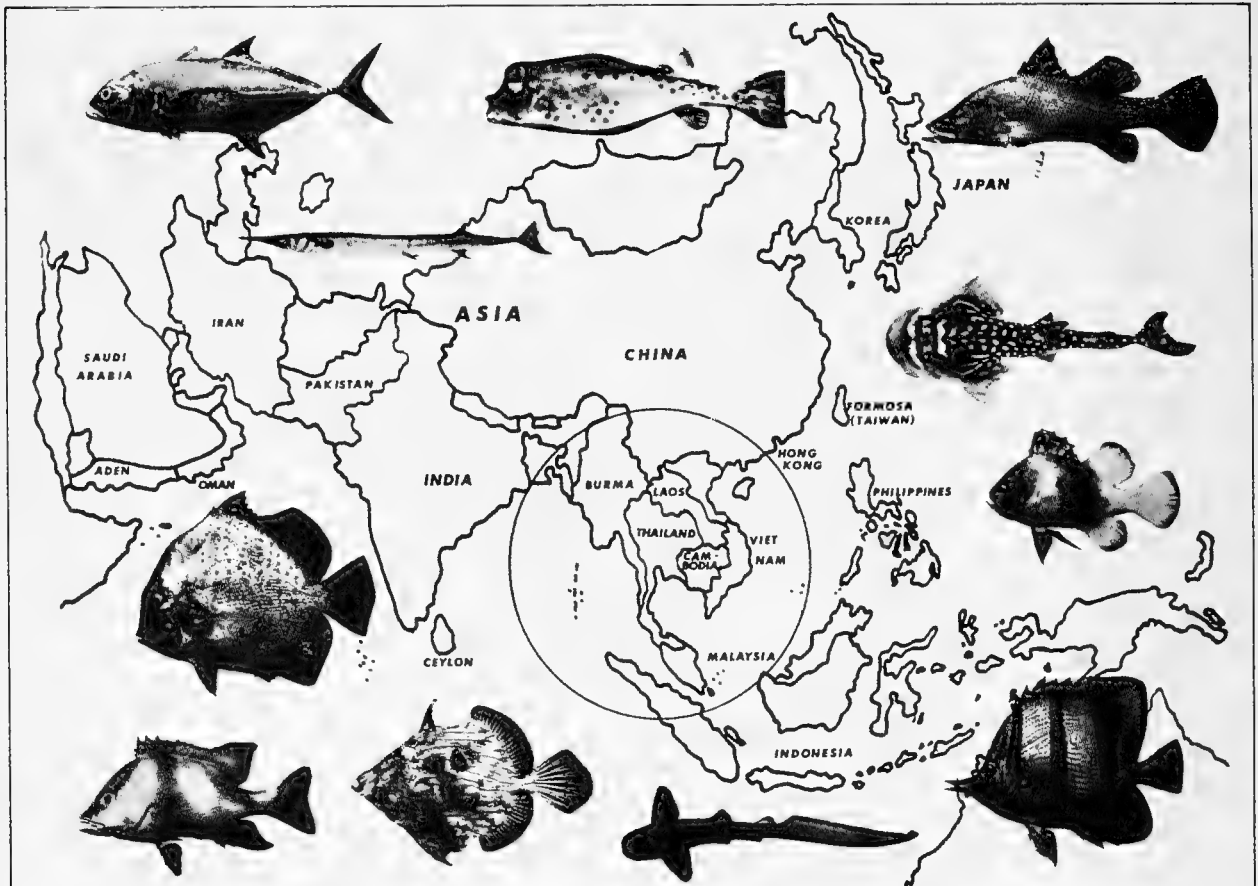


Fig. 1 - Shows the Asiatic region (where one-half of the world's people live) with its seas and estuaries, good sources of food if fishery resources can be properly developed.

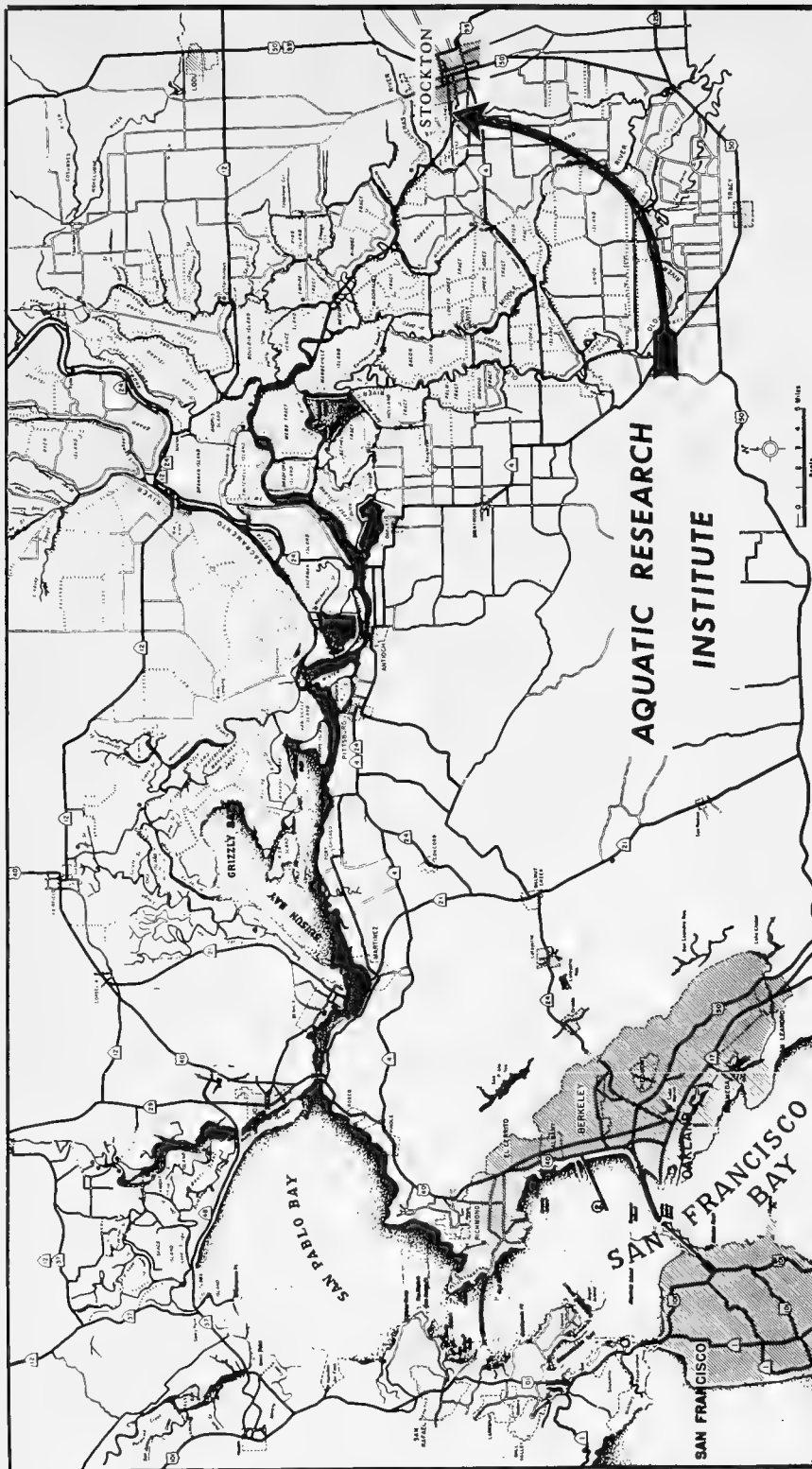


Fig. 2 - Shows the Sacramento and San Joaquin Delta area in central California.

stream tributaries. Other migrants in the Delta are striped bass, shad, and sturgeon. Fish which live their entire lives in the Delta area include bass, crappie, sunfish, catfish, and carp. There are many species of invertebrates in the Delta, the most prominent being shrimp and clams. Over two hundred species of birds have been reported. Mammals present include mink, beaver, racoon, and river otter.

Tidal estuaries in many parts of the world today are providing important commercial quantities of protein. Scientific investigations in the Sacramento-San Joaquin Delta can aid in solving basic problems in the development of estuarine fisheries.

The Aquatic Research Institute will be aided by its nearness to other research groups such as the Delta Wildlife Study, which is a California State project with headquarters and laboratories in Stockton. The San Joaquin Delta College, and the University of the Pacific are also located in Stockton, and the universities in the San Francisco Bay region are only a short distance away.

The Asian Program: An enormous resource of food is believed to be available in the seas and estuaries surrounding tropical Asia. The development of fisheries to harvest those resources is a major goal of the Aquatic Research Institute.

The George Vanderbilt Foundation, which was the forerunner to the Aquatic Research Institute, accomplished considerable work in Asia between 1950 and 1961. Fishery surveys were conducted in the South China Sea, Gulf of Thailand, Andaman Sea, Indian Ocean, French Oceania, Line Islands, Trust Territory of the Pacific Islands, and the Hawaiian Islands. A handbook of the food fishes of the Gulf of Thailand and a book on the fisheries of the Western Caroline Islands were completed. In addition, training programs were carried out for fisheries officers, aquatic biologists, and ichthyologists of the United States, Thailand, Hong Kong, South Viet Nam, Philippines, South Korea, Taiwan, Japan, and other countries of southeast and east Asia.

The plans of the Aquatic Research Institute call for: (1) completion of Asian research programs initiated by the George Vanderbilt Foundation; (2) preparation and publication of handbooks, manuals, and technical reports on

the food fish, fisheries, and aquatic ecology of Asian regions; (3) establishment and operation of an overseas regional laboratory and training center in Bangkok, Thailand; and (4) initiation of a training program for Asian and American students.



Refrigeration

TECHNICAL SYMPOSIUM ON FREEZING OF FISHERY PRODUCTS:

The semiannual convention of the American Society of Heating, Refrigerating and Air-conditioning Engineers was held at the Hotel Roosevelt, New Orleans, La., January 27-29, 1964. It featured a symposium on the freezing of seafoods chaired by Charles Butler of the U. S. Bureau of Commercial Fisheries, Washington, D. C., who is a member of the International Institute of Refrigeration. The purpose was to acquaint managers, engineers, and technical people in the refrigeration and seafood industries with developments that have taken place in the freezing of fish and fishery products over the past 40 years.

A review paper on the history of refrigeration in the United States fishing industry was given by Harden Taylor, one of the pioneers in the freezing of fishery products. It reviewed some of the early methods of freezing fish and discussed the growth of the frozen seafood industry.

Quality changes that occur in shrimp and methods for further improving product acceptability and wholesomeness were discussed by Dr. Arthur Novak of Louisiana State University. New preservation techniques on the use of ionizing radiation in extending the natural fresh qualities of refrigerated shrimp were also described.

Time-temperature tolerance of frozen foods was the subject of a paper by John Peters of the U. S. Bureau of Commercial Fisheries Technological Laboratory, Gloucester, Mass. It included a discussion of research on the quality changes that occur in frozen foods during storage and distribution; and some recent results of research being conducted at the Gloucester laboratory and their importance to the refrigeration industry.

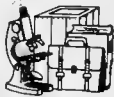
Quality changes in fishery products was the subject of a paper presented by Dr. William

Dyer of the Fisheries Research Board of Canada. The biochemical changes that take place in fish prior to, during, and after freezing, and their significance to fish quality were discussed.

The freezing of seafood now and in the future was discussed by Joseph W. Slavin, Acting Chief of the Bureau of Commercial Fisheries Branch of Technology. Information was given on methods for estimating the freezing rates of fishery products and on commercial freezing techniques.

A paper on the role of the refrigeration engineer in the seafood industry by Luke St. Onge of V. C. Patterson and Associates concluded the session. The daily problems of refrigeration engineers in designing fish storage and freezing installations were discussed; some specific applications were dealt with in detail.

Registration at the convention was open to the public and registrants were invited to attend the symposium.



Sardines

MAINE PACK, 1963:

A total of 1,584,000 standard cases (100 3 $\frac{3}{4}$ -oz. cans) of Maine sardines was canned during the 1963 packing season, according to the Maine Sardine Council. Although this was considerably less than the 2,117,000 cases produced during the 1962 season, it was well ahead of the critically small pack of only 671,000 cases in 1961, when there was a shortage of fish.

The Maine Sardine Council's Executive Secretary said that fish were abundant in all areas along the coast for most of the season in 1963 and that this gave canners a wide selection which enabled them to produce a high quality pack. He said that a policy of balanced production from season to season by most canners had resulted in an increasingly favorable inventory situation which should further improve with the usual high Lenten demand. "Markets and distribution temporarily lost to imports because of the 1961 shortage have been mostly recovered so that the Maine sardine industry now enjoys well over 50 percent of the total sales of all sardines in the United States," according to the Council's rep-

resentative. He also pointed out that volume movements in a recently launched export market development program have further helped to bring inventories into favorable balance.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, DECEMBER 1963:

| Item and Period | 1963 | 1962 | 1961 | 1960 |
|--|---------|---------|---------|---------|
| ... (1,000 Lbs., Heads-Off) ... | | | | |
| Total landings, So. Atl. and Gulf States: | | | | |
| February | 3,986 | 4,123 | 3,910 | 3,784 |
| January | 3,993 | 3,833 | 5,686 | 5,402 |
| December | 10,300 | 8,615 | 6,538 | 7,099 |
| November | 13,212 | 12,177 | 9,996 | 14,454 |
| January-October | 115,448 | 85,047 | 74,861 | 119,481 |
| January-December | 138,960 | 105,839 | 91,396 | 141,035 |
| Quantity canned, Gulf States 1/: | | | | |
| February | 281 | 241 | 90 | 204 |
| January | 592 | 492 | 183 | 266 |
| December | 2,180 | 1,879 | 816 | 894 |
| November | 2,400 | 2,727 | 2,175 | 1,535 |
| January-October | 24,752 | 18,604 | 11,508 | 23,965 |
| January-December | 29,332 | 23,210 | 14,500 | 26,394 |
| Frozen inventories (as of end of each mo.) 2/: | | | | |
| February 28 | 28,039 | 19,012 | 37,612 | 29,063 |
| January 31 | 28,487 | 21,328 | 37,842 | 34,332 |
| December 31 | 3/ | 31,577 | 19,755 | 40,913 |
| November 30 4/ | 42,142 | 27,500 | 20,668 | 37,264 |
| October 31 4/ | 37,418 | 21,315 | 17,811 | 31,209 |
| September 30 | 27,356 | 12,843 | 13,361 | 24,492 |
| Imports 5/: | | | | |
| February | 12,100 | 10,599 | 8,932 | 7,657 |
| January | 13,139 | 12,907 | 12,338 | 8,596 |
| December | 3/ | 15,798 | 15,442 | 12,411 |
| November | 14,759 | 17,964 | 14,852 | 13,516 |
| January-October | 120,474 | 107,421 | 95,988 | 87,492 |
| January-December | 3/ | 141,183 | 126,268 | 113,418 |
| (¢/lb., 26-30 Count, Heads-Off) | | | | |
| Ex-vessel price, all species, So. Atl. and Gulf Ports: | | | | |
| February | 85.7 | 78.9 | 53.5 | 51.8 |
| January | 85.0 | 76.3 | 52.5 | 49.5 |
| December | 6/54-65 | 82.9 | 75.2 | 54.2 |
| November | 6/52-62 | 84.5 | 73.5 | 54.0 |
| October | 6/51-64 | 90.0 | 68.7 | 53.0 |
| September | 6/55-64 | 90.9 | 70.1 | 52.2 |
| August | 59.0 | 83.6 | 66.1 | 52.0 |
| July | 63.5 | 82.1 | 55.8 | 54.6 |
| Wholesale price froz. brown (5-lb. pkg.) Chicago, Ill.: | | | | |
| February | 102-106 | 93-95 | 69-71 | 65-67 |
| January | 102-106 | 91-94 | 69-71 | 64-66 |
| December | 75-82 | 101-107 | 91-92 | 68-70 |
| November | 71-78 | 105-110 | 89-92 | 69-73 |
| October | 67-75 | 108-115 | 83-90 | 69-73 |
| September | 73-77 | 113-118 | 87-90 | 65-70 |
| August | 75-81 | 110-112 | 76-91 | 64-67 |
| July | 77-97 | 3/ | 70-75 | 72-77 |

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. The figures in the section (Quantity canned, Gulf States) have been completely revised beginning with February 1963 on the basis of a new conversion factor (formerly 33.0 pounds per case).
 2/Raw headless only; excludes breaded, peeled and deveined, etc.
 3/Not available.
 4/Inventory of September 30, 1963, includes 2,868,000 pounds, and November 30, 1963, includes 1,189,000 pounds for firms not reporting previously.
 5/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
 6/Range in prices at Tampa, Fla.; Morgan City, La.; area; Port Isabel and Brownsville, Texas, only.
 Note: December 1963 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

POSTLARVAL STUDIES INDICATE POSSIBLE VALUE AS INDEX OF ADULT POPULATION:

The first year of the postlarval shrimp study being made by the Mississippi Gulf Coast Research Laboratory under a U. S. Bureau of Commercial Fisheries contract was completed in October 1963. Although identification of all specimens to species has not been completed, it seems likely that a satisfactory index for prediction of the adult population of commercial species of shrimp is being established. Retention of all samples has produced a large quantitative collection of many species living along the shores of Mississippi Sound and adjacent bays. Records of hydrographic data are extensive.

The contract with the Bureau has been renewed and data for another year will be collected and compared to what has already been completed.



Smoked Fish

STATUS REPORT ON SMOKED FISH-PROCESSING STUDIES CONDUCTED IN GREAT LAKES REGION:

The progress made on smoked fish processing studies to test the effects of certain process time/temperatures for the production of smoked chub is outlined in a report issued on January 10, 1964, by the Regional Director, U. S. Bureau of Commercial Fisheries, Ann Arbor, Mich. The studies were conducted at the Bureau's Great Lakes Technological Laboratory in Ann Arbor.

One of the first objectives of these smoked fish-processing studies was to evaluate product quality as affected by interim processing guidelines provided by the U. S. Food and Drug Administration (FDA) and States concerned with the subject. Initial tests were completed by early January, and procedures that were used, results obtained, and their significance to the fishing industry follow:

General Procedures:

1. Raw Material: Fifty-pound blocks of dressed "medium" chub frozen at 0° F. in alginate were used.

2. Thawing of Blocks: The 50-pound blocks were removed from frozen storage and thawed by immersing in a tank of cold

tap water for periods of time ranging from 8-12 hours.

3. Brining: The brining operation was conducted in a large plastic tank. Granulated salt was poured into the empty tank in an amount estimated to make a sufficient quantity of brine. Cold tap water was then added to the tank by use of a hose. Hose pressure was used to stir the mixture to facilitate solution. Salometer readings were made at frequent intervals to achieve desired brine strength.

4. Smoking: After brining, the fish were individually hung head-down on "smoke-sticks." The weight of fish on each stick was then obtained to the nearest 0.1 pound for "brined weight." These sticks have a series of pairs of sharp-pointed nails protruding on two sides. The fish are hung on the sticks by skewering them at the tail-end on the nails. Each stick held about 5 pounds of fish, and 2 sticks were used to evaluate each of the subsequent treatments.

Traditional wood-fired ovens were used for tests 1 and 2. For subsequent tests, a small gas-fired smokehouse was used in order to achieve controlled conditions of temperature (no control of relative humidity).

During each test, thermocouples were inserted into several representative fish and others were left exposed in several locations within the smokehouse. Continuous recordings were made of internal temperature of product and smokehouse temperature by use of a gas-fired 24-point recording potentiometer.

For all tests using the gas-fired oven, the smokehouse remained cold until the fish were loaded therein. After loading, heat was applied to the oven, at which time the smoke generator was turned on and smoking was continued throughout the process.

After processing, the fish were removed from the smokehouse and placed in a 0° F. freezer for a minimum of one hour to cool. After cooling, the fish were weighed to the nearest 0.1 pound to obtain "smoked weight."

5. Holding Conditions: Upon completion of weighing, the fish were packaged either in bulk or vacuum packs, and either frozen at 0° F. or stored at 36° F.

Yield: Percentage yield was obtained by the following formula:

$$\frac{\text{smoked wt.}}{\text{brined wt.}} \times 100 = \% \text{ yield}$$

Results:

1. Raw Fish: Analyses of frozen, raw control samples were as follows:

| | |
|---------|--------|
| % water | - 75.9 |
| % fat | - 7.0 |
| % salt | - 0.1 |

2. Smoked Fish: Analyses of smoked samples heated to various internal temperatures were as follows:

| Test No. | Brine Strength | Maximum Internal Temp. °F. | Percentage of | | | |
|----------|----------------|-------------------------------|---------------|-----|------|-------|
| | | | Water | Fat | Salt | Yield |
| 1 | 25° - 12 hrs. | 165° | 68.7 | 9.6 | 4.0 | 70 |
| 2 | 25° - 12 hrs. | 180° | 63.4 | 9.3 | 4.5 | 57 |
| 3 | 25° - 15 hrs. | 180° | 69.0 | 8.2 | 4.9 | 72 |
| 4 | 25° - 15 hrs. | 180° for 30 min. | 67.3 | 7.2 | 6.0 | 67 |
| 5 | 25° - 15 hrs. | 160° for 5 hrs. | 57.8 | 9.5 | 7.6 | 54 |

Note: Unless otherwise indicated, product was removed from oven when maximum internal temperature was attained. Otherwise, maximum internal temperature was maintained for time period indicated.
 Tests 1-2 conducted in wood-fired smokehouse.
 Tests 3-5 conducted in gas-fired smokehouse.
 Tests 3-4 total process time of 2 $\frac{3}{4}$ hours.
 Test 5 total process time of 6 $\frac{3}{4}$ hours.

3. Pasteurization after Smoking: Samples of smoked fish were vacuum-packaged in plastic pouches and placed in water heated to 190° F. It required 40 minutes for the internal temperature of the product to reach 180° F.; this temperature was then maintained for an additional 30 minutes.

The plastic pouch used for water-bath pasteurization was a lamination of cellulose and polyethylene. Although the pouch remained intact during the treatment, it acquired a "frosted" appearance. However, more suitable materials would be readily available commercially.

It was noted that little or no moisture or oil was rendered from the smoked fish into the pouch as a result of pasteurization such that the product's appearance would be objectionable. The meat of the pasteurized fish remained firm and moist.

Discussion:

The primary purpose of the tests was to determine the effect on product quality of

processing smoked chub to an internal temperature of 180° F. for 30 minutes. The attribute of quality was considered, for this purpose, to be the general eating qualities of flavor, texture, and degree of moistness of the edible portion, plus the general appearance of the product as contrasted with that of chub smoked in the traditional manner. Also considered were such economic factors as percentage of yield of smoked product and time required to process.

The results of the tests indicated that chub can be processed in a controlled smokehouse to an internal temperature of 180° F., maintained at this temperature for 30 minutes, and produce an acceptable product in terms of eating quality. Comparison of this product to chub smoked to lower internal temperatures (i.e., 165° F.) in wood-fired ovens permits the following general observations:

1. Over-all appearance of the new product seemed reasonably acceptable. Some wrinkling of the skin was noted, but was not judged to be excessive. Color was poor (light), but could probably be corrected with a more suitable smoke generator.

2. Yield of products smoked conventionally in a wood-fired smokehouse equalled 70 percent. Yield of products processed to 180° F. for 30 minutes in a gas-fired smokehouse equalled 67 percent (total process time = 2 $\frac{3}{4}$ hrs.).

3. Incidence of fish dropping from the smoke sticks during heating was extremely low (of 300 pounds processed, a total of 3 fish fell to the bottom of the oven).

4. Taste test indicated the meat to be somewhat less moist than the conventional product, but not objectionably so.

5. Texture of meat was somewhat firmer than the conventional product.

6. Preliminary comparisons of frozen versus refrigerated samples clearly indicated significant "softening" of the texture as a result of freezing.

Smoked Fish Manual: One action the Bureau of Commercial Fisheries planned was the preparation of a manual that would describe good commercial sanitary processing and handling techniques and the significance

of Cl. botulinum type E to the industry. Such a smoked fish-processing and handling manual, providing interim guidelines for process and sanitation control, is being prepared and is expected to be available to industry in draft stage at least, in a relatively short time. Included in the manual will be sections on botulinum food intoxication, process and sanitation control recommendations, and a sanitation checklist for processors.

Research on Cl. Botulinum Type E: Type E botulism has been traced to smoked fishery products manufactured in Great Lakes States. Review of the botulinum outbreaks and other information on the distribution and properties of the organism clearly indicates that Cl. botulinum type E represents a serious potential hazard in smoked fishery products. Recognizing the seriousness of this matter, regulatory agencies have taken emergency interim measures considered adequate to safeguard the consumers. Aside from the impact of these events on the consumer, these emergency regulations have dealt the smoked fish industry a crushing blow, particularly in the Great Lakes region.

Recognizing the need for prompt attention to certain problem areas requiring specialized knowledge and research on Cl. botulinum type E, the Bureau of Commercial Fisheries has initiated contract research studies, the results of which will allow for the more orderly development of the required processing and handling codes for the smoked fish industry. A contract has been effected with the University of Wisconsin. Professor E. M. Foster, Bacteriology Department, will be conducting studies for the development of thermal death time curves for Cl. botulinum type E toxin and spores on smoked fishery products, as affected by certain product variables. A research contract has also been negotiated with Michigan State University. Professor R. Lechowich, Department of Food Science, will be concerned with methodology for recovery of low levels of type E toxin and spores from smoked fish as well as with heat resistance of the spores and temperature requirements for toxin formation in smoked fish.

When results of the processing work and the contract work, described before, have been obtained, it will then be possible to go to FDA and the various cooperating states with a definite proposal to modify the interim processing regulations now in effect with the intent to substitute regulations based on

scientific evidence that the industry can live with.

Progress in Marketing and Consumer Education: Consumer confidence in all fishery products marketed in the Great Lakes has been badly shaken, and in some instances destroyed, as a result of the publicity stemming from the botulism incidents and the FDA warning to the public about the use of smoked fish from Great Lakes processing plants. The publicity was erroneously interpreted by the public to include fresh and frozen fishery products despite efforts on the part of industry to clarify FDA action.

As a result, sales of fish in retail outlets dropped off 30 to 50 percent, and even more in some localities. Restaurants have reported sales of fish dinners off 25 to 60 percent. Fish have been taken off some school lunchroom menus. Inventories of fish used for smoking in the Great Lakes area persist at high levels and most Great Lakes fishermen have been informed to stop fishing.

United States consumer fear of Great Lakes fishery products has international implications as well. The Canadian Consulate at Detroit, Mich., reported that sales of Canadian fresh-water fish to United States customers have drastically declined--whitefish as much as 80 percent.

Great Lakes fishery associations have requested Bureau of Commercial Fisheries assistance in developing and implementing an intensive market promotion program in the Midwest. In response to that request, the Bureau's marketing program in the Midwest has been reoriented, and the marketing staff was active for six weeks in a stepped-up consumer education effort calculated to restore consumer faith in fishery products.

Emergency consumer education activities by the Bureau of Commercial Fisheries to help restore confidence in fishery products included: 7 live TV fish-cookery demonstrations, 6 taped TV demonstrations, 4 radio interviews, 4 TV interviews, and 1 presentation for an Executive Chef Association. These were presented in five states. In addition, three 10-minute video tapes of fish-cookery methods were made at a Chicago educational television station at the Bureau's expense. Copies of the tapes will be used by the Bureau's marketing specialists in scheduling programs throughout the Midwest and other areas.

Bureau of Commercial Fisheries personnel from the Ann Arbor Regional Office have held meetings with fishery association groups in Michigan, Illinois, Wisconsin, Minnesota, and Ohio, to explain the botulism problem, to discuss the effects of the adverse publicity on the fishing industry, and to plan avenues of corrective action. It is generally agreed that an all-out industry-Government promotional effort is needed to restore the good image of fishery products to Midwest consumers and, almost as important, to help restore the confidence of the fishing industry in itself and in its products. It has been agreed further that such a promotion was to begin immediately, with a gradual buildup occurring during the Lenten period, peaking in the spring, and continuing at a high level throughout the coming year. It is generally recognized that this will not be an easy task and that intensive cooperative industry-Government efforts will be necessary if normalcy is again to be restored to the markets for fishery products in the Midwest.

Some promotional activities have been undertaken by the fishing industry. The Fisheries Council of the Great Lakes was formed in Detroit. This group sponsored a fish buffet served in the Michigan Capitol Rotunda to almost a thousand persons. The Wisconsin Fisheries Council planned promotional activities to begin the first week in February. Similar plans have been stimulated for a Minnesota promotion through industry members in Duluth. Chicago industry members were also studying promotional action. Prospects look favorable that these groups and others can be drawn together for concerted action.

Major Great Lakes industry associations were organizing a concerted market promotion effort in the Midwest. At the request of industry, an industry-Government marketing assistance proposal was prepared for consideration. Invitations were sent to the associations and to major industry members to send representatives to a meeting held January 11, 1964, in the Bureau's Ann Arbor Regional Office to discuss the initiation of an action program. It was further hoped that this meeting will be the vehicle for organizing a Great Lakes-wide action group to speak and act for the entire industry, in all of its phases.

Note: See Commercial Fisheries Review, December 1963 p. 85.



South Atlantic Exploratory

Fishery Program

SCALLOP DISTRIBUTION SURVEY OFF FLORIDA:

M/V "Silver Bay" Cruise 51 (November 6-19, 1963): To assess the seasonal distribution and availability of calico scallops (Pecten gibbus) off the east coast of Florida between St. Augustine and Stuart was the primary objective of this 14-day cruise by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay.

A total of 177 dredging stations were occupied with 6- and 8-foot tumbler dredges fitted with 2-inch bag rings and 2-inch mesh nylon liners. The best catches were made in a strip roughly 10 miles long and 2 miles wide, centered at latitude 28° 30' N., at a depth of 26 to 27 fathoms. There the average catch rate was 12 bushels of shell stock per 30-minute drag. The largest individual scallop catch was 12 bushels in 15 minutes. The scallops in that area averaged 50 to 55 millimeters (1.97-2.17 inches). Their shucked yield averaged 107 meats per pint (see map on page 48).

In all areas surveyed, dead shell dominated the catches. In depths of 12 to 32 fathoms, catches of small scallops--25 to 45 millimeters (0.98-1.77 inches) in diameter--were common.

Seven shrimp-trawling stations were occupied with a 50-foot flat trawl with 6-foot chain doors. Only small catches of white shrimp (Penaeus setiferus) resulted.

Note: See Commercial Fisheries Review, January 1964 p. 29.

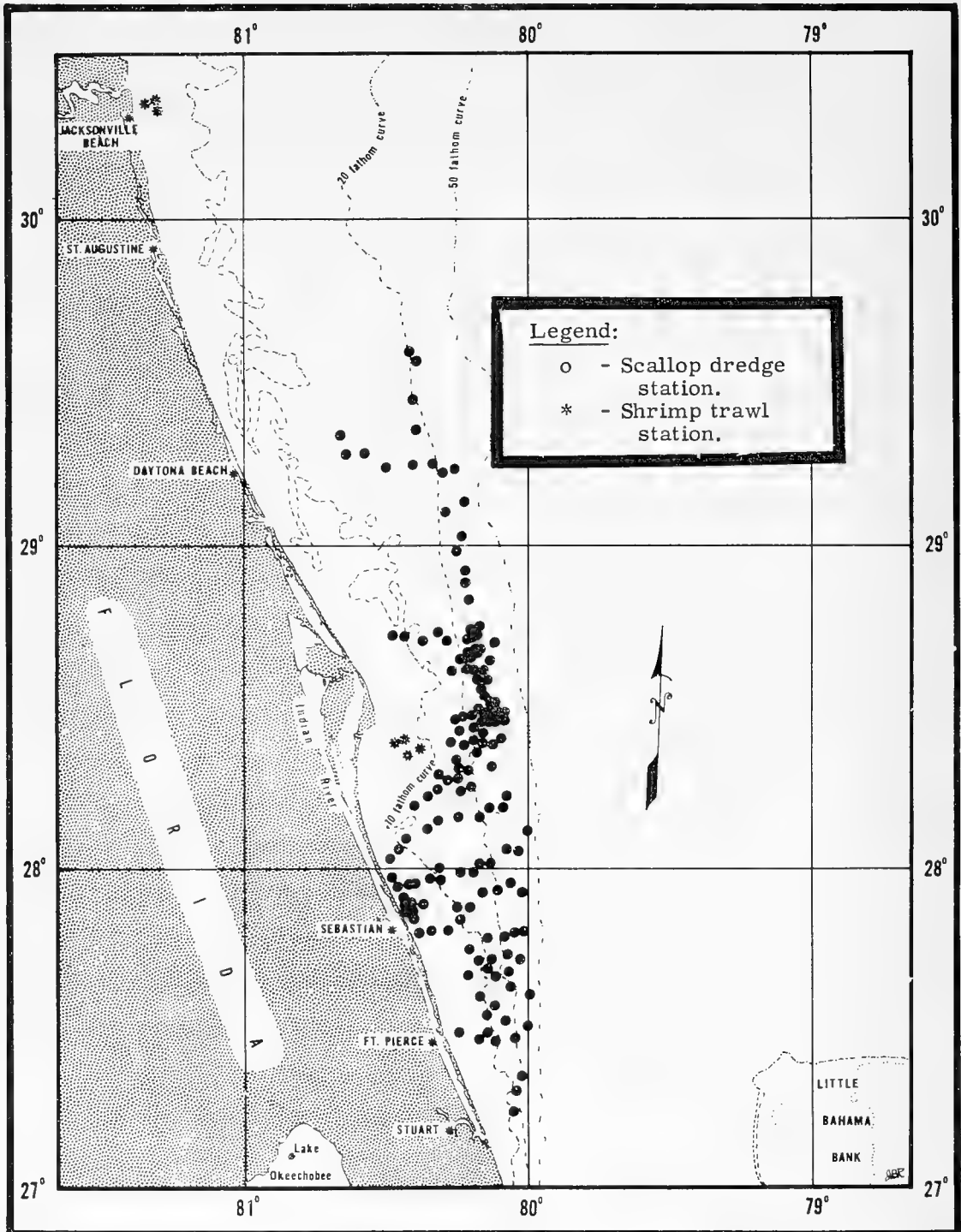


South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JULY-DECEMBER 1963:

A report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for July-December 1963, follows:

Oyster Studies: Experiments were continued during the last half of 1963 to test the effectiveness of supplemental feeding of oysters. Experiments were again carried out in



Area investigated off Florida during Cruise 51 of the M/V Silver Bay.

three 12 x 12 foot concrete tanks. The overflow in the tanks was arranged so that each tank held approximately 1,350 gallons of water. Approximately 100 oysters were used in each experiment. Each feeding experiment lasted 30 days. Individual oysters used for controls in one experiment were fed in the second experiment. In some experiments the situation was reversed and oysters which had been fed during one month were used as controls during the second month. In all experiments those oysters which were fed with various forms of carbohydrates increased in weight over the control experiments. In broad generalities, the gain in weight of the fed oysters was usually three times that of the controls. Further work will continue on the supplemental feeding of oysters.

Shrimp Studies: Brown shrimp were slightly more numerous at regular survey stations during the last half of 1963 than in that period of 1962. White shrimp, however, were almost five times less plentiful at regular survey stations from July through December of 1963 as during that time in 1962. Of the major kinds of commercial fish and shellfish sampled by experimental trawling, white shrimp were the only species which showed a marked decline during the last half of 1963 as compared with that period in 1962. The reasons for the decline in the numbers of white shrimp this year are not known, but it is possible that the extremely cold winter of 1962/63 was responsible. White shrimp, considerable numbers of which normally winter-over in coastal sounds and rivers, disappeared from inshore waters during the winter of 1962/63 and very few roe shrimp appeared in the spring of 1963.

Fin Fish: Experimental trawling at regular stations from July through December revealed that croakers were slightly more abundant in inshore waters during that period than during the same period of 1962. The catch for spot was also approximately the same during the two periods, indicating that there has been no major changes in population of those fish during the past two years.

Fish Tagging: Through December 1963, over 300 fish of various species had been tagged with Peterson disc tags and released throughout coastal waters. Only five tags were returned (all by sports fishermen) as of the end of 1963. The principal species tagged were croaker, spot, flounder, pigfish, whiting, sea trout, and black fish. Tags from

two croakers, two pigfish, and one large king whiting were returned. The croakers and pigfish had moved only short distances from the place where they originally were caught and tagged, in spite of the fact that one fish had been free for 85 days before it was caught. The king whiting was caught on hook and line about one month after being tagged and released, approximately 22 miles from where it was originally captured.

This study will continue during 1964 and it is felt that valuable information will be obtained concerning the movements, growth rates, etc., of various species of marine fishes in South Carolina waters.

Blue Crabs: Blue crabs were slightly more abundant in experimental trawling in coastal waters during July through December 1963 as compared with that period of 1962. The average catch per unit of effort for immature crabs at regular survey stations for the July-December period of 1963 was 9.9 crabs, as compared with a catch per unit of effort of 7.5 in 1962. The average catch per unit of effort for adult blue crabs was 15.2 during the 1963 period, whereas in 1962 the average catch per unit of effort was 13.9.

Large female blue crabs were very plentiful in sounds and offshore during November and early December, but the sudden drop in water temperatures in mid-December apparently caused a migration to deeper waters offshore as trawl catches declined markedly at this time.

Pond Cultivation: Two one-acre ponds were harvested in October 1963. One of the ponds, the "fish pond," had been allowed to stock naturally by opening the flood gates on March 11 and allowing postlarval shrimp to "flow" into the pond until it was closed on May 7. The flood gates were reopened again from June 25 to August 30 for further inflowing of postlarval shrimp. The other pond, the "oyster pond," was stocked by hand during May to September with approximately 1,100 shrimp of mixed species. Both ponds were treated with rotenone on May 7 and August 7, 1963 (each pond treated twice), to remove predaceous fishes. Crab pots were used in each pond to remove crabs. As food for the shrimp over 500 pounds of chopped trash fish was put in each pond during June to September.

In 1963 the fish pond yielded 14 pounds of shrimp, heads-on, in $7\frac{1}{2}$ months. However, in

1962 the same pond treated in the same manner yielded a harvest of 163 pounds of shrimp, heads-on, in 4 months.

In 1963 the oyster pond, hand-stocked with 1,100 shrimp, gave a harvest of 855 shrimp weighing 43 pounds 6 ounces in $7\frac{1}{2}$ months. In 1962 the same pond, hand-stocked with 8,164 shrimp, gave a harvest of 15,500 shrimp weighing 238 pounds 14 ounces in 4 months. Obviously in addition to the hand-stocking some shrimp as postlarval or as small juveniles entered the pond naturally when exceptionally high tides forced open the flood gates.

The difference in the yield of the ponds, particularly the fish pond, seems to be a reflection of the scarcity of postlarval shrimp in estuarine waters of South Carolina.

New Research Vessel: On September 7, 1963, the hull of the new research vessel for Bears Bluff Laboratories was launched at Cainho, S. C. The boat was designed to fit specifications for estuarine research. She is 58 feet long with a beam of 18 feet and draws only 42 inches of water. After launching, the boat was towed to Wadmalaw Island and a Diesel motor was installed by the staff of the Laboratories. Carpenter work and finishing of cabin, laboratory space, and living quarters is now under way. Trial runs to check the engine were made just before Christmas. The performance of the boat was excellent.

Note: See *Commercial Fisheries Review*, August 1963 p. 51.



Sports Fishing

NEW FEDERAL SPORTS FISHING RESEARCH LABORATORY TO BE BUILT ON UNIVERSITY PROPERTY:

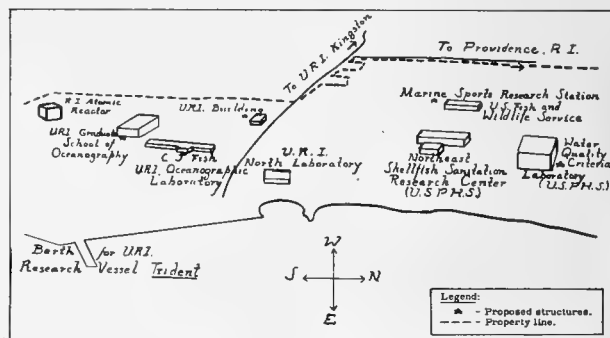
One of the final steps to locate a Federal sports fishing research laboratory in Rhode Island, was taken when the University of Rhode Island President reported on December 16, 1963, that the University and the U. S. Department of the Interior had reached an agreement, allocating a three-acre site of land for the laboratory. The University is processing the deed which will give the Federal Government a parcel of land on its Narragansett Bay Campus, directly to the west of the Northeast Shellfish Sanitation Research Center.

The Narragansett Bay Campus of the University of Rhode Island is well on its way to

becoming one of the world centers for research in the marine sciences, the University's President stated. He added, the location of a third Federal facility in the area will give added impetus to this trend.

He also stated that the area will be of great benefit to the economy of Rhode Island and the nation. Though popularly neglected, there is a growing feeling that research into the sea may hold as great a potential for the future as space science.

The initial Federal investment in the area is expected to exceed \$3.5 million. Counting the staff at the headquarters for the University of Rhode Island Graduate School of Oceanography, this will result in the employment of over 300 scientists, technicians, and staff people.



Sketch showing the site and where proposed structures for the new Federal sports fishing research laboratory is to be built on the University of Rhode Island's Narragansett Bay Campus.

Shortly after receipt of an allotment for site selection and engineering design, the Chief of the Division of Sports Fisheries of the Interior Department's Bureau of Sport Fisheries and Wildlife said his Unit wanted to find out what it takes to produce game fish and how they can spawn in large numbers, and get enough food.

In addition, the Division is interested in studying the effects of pollution and pesticides on fish. The Rhode Island facilities would also be used as a base to move up or down the coast to check fish migration.

Previously, the University donated 5.3 acres of land for the \$1,165,000 Northeast Shellfish Sanitation Research Center, now nearing completion, and 7.2 acres for the proposed \$1,750,000 Water Quality Laboratory. Still another parcel was given to the Rhode Island Atomic Energy Commission for the \$1

million nuclear reactor. (Public Information Department, University of Rhode Island, December 13, 1963.)



Striped Bass

TAG RETURNS SOUGHT FROM LONG ISLAND MARKING PROGRAM:

A total of 579 large striped bass have been tagged along the south shore of Long Island by the New York State Bureau of Marine Fisheries. The fish--ranging in size from 6 to 50 pounds--were marked with red and white plastic disc tags.

The Fish Research Unit of the New York State Bureau of Marine Fisheries late in 1963 had completed a three-year program of tagging striped bass from the surf along the south shore of Long Island (Fire Island), New York. Only fish of six pounds or heavier were tagged in an effort to learn more about the movements and seasonal migration of larger, mature striped bass. Although many thousands of striped bass have been tagged at various times and stations along the Atlantic Coast, very few of the fish have been of considerable size.

Biologists of the U. S. Bureau of Commercial Fisheries, having consolidated and analyzed data from several sources in North Carolina and Chesapeake Bay, concluded that large striped bass which concentrate on the North Carolina coast in winter and in Chesapeake Bay in later winter and spring move northward as far as Massachusetts in spring and summer. It is important to know, from the point of view of striped bass management and utilization, if this great movement is annually cyclic and to learn if fish from the more northern part of this species' extensive range return in the fall as far south as the North Carolina coast and the major southern spawning grounds.

During the past three years almost 4,200 striped bass from the ocean front along Fire Island Beaches were carefully examined and, of those, 579 (about 14 percent) were in the large category. The larger fish--ranging from 6 to 50 pounds--were marked with two red and white plastic, serially numbered Petersen disc tags by fastening the discs on the upper back between the dorsal fins with a stainless steel pin.

For efficient management and utilization, it is important to investigate further the extent and time of striped bass migrations. Cooperation of fishermen is needed to insure the success of the current study. Tags recovered from the striped bass tagged off Long Island should be returned, together with the date and location of capture, to New York State Conservation Department, D-J Fish Research Unit, Oakdale, New York, 11769. A nominal reward of one dollar, as well as information concerning the tagged fish, will be given for each set of red and white discs.



Transportation

RATE INCREASE SOUGHT BY NEW ENGLAND TRUCKERS:

The New England Motor Carrier Rate Bureau held public hearings on December 18, 1963, on its proposal to increase rates and wages approximately 8½ percent to cover higher cost of labor and supplies. Over 100 shippers and trade associations voiced strenuous opposition to the proposal.

This proposal is not intended to cover any increases in wages which may result from the current negotiations between the Teamsters Union and the trucking industry for nationwide wage increases totaling \$200 million a year. It is reported that an official of the Teamsters Union opened the negotiations with a statement that truckers will be required to increase rates 7 percent to cover the cost of increased wages, and should get a 15-percent increase to cover past increases.

* * * * *

REA EXPRESS FILES TARIFFS TO INCREASE CHARGE:

Tariffs have been filed by REA Express which would increase charges on all express movements by 25 cents per shipment effective January 27, 1964. On February 8, 1962, an increase of 10 cents per shipment was effected by this carrier and a widespread adjustment to fishery rates was made in November 1961.

Any protests by the fishing industry on the proposed increase were to be filed with the Interstate Commerce Commission (ICC) before January 17, 1964.

* * * * *

ALASKA-WASHINGTON RAIL-BARGE SERVICE EXPANDED:

A West Coast firm announced the launching, on December 11, 1963, of the Kenai, a hydro-train barge, reported as being the largest ocean vessel of that type ever built. The barge is 342 feet long with a capacity of 42 normal length railroad cars. The Kenai is to be used in weekly sailings from Seattle, Wash., to Whittier, Alaska. It will supplement the service provided by the Clair Engle, the original barge link in the all-rail route between Seattle and Whittier.



Tuna

RESULTS OF BLUEFIN TAGGING IN ATLANTIC OCEAN BY WOODS HOLE OCEANOGRAPHIC INSTITUTION:

Included in the Cooperative Game Fish Tagging Program of the Woods Hole Oceanographic Institution is the bluefin tuna in the Atlantic Ocean. The 1963 report on the game fish-tagging program points out that the most important results concern the bluefin tuna. Increasing commercial pressure on that species is shown by the dramatic increase in returns from the northwestern Atlantic fishing area, from Maryland waters to off southern New England. These rose from a total of 6 for the years 1954-1962 combined to 19 for the 1963 season alone. No less than 7 of 29 bluefin marked in the inshore waters of that area last summer have been already recaptured, as have 4 of 29 marked further offshore early in June, about 120 miles southeast of Nantucket. The other 1963 returns were obtained from 4 fish marked in 1962, 3 in 1961, and 1 in 1960. These returns suggest that in the 1963 season a group of bluefin in the 100-pound class moved west southwest from off Oceanographer Canyon to coastal waters off Ocean City, Md., then northward and eastward to off Block Island and finally into Massachusetts Bay, while smaller individuals moved from off Montauk eastward toward the Martha's Vineyard grounds and then back to the westward again. Unfortunately these samples are too small to be of conclusive statistical significance.

More tags from all species of game fish tagged by the Institution's cooperative game fish-tagging program were returned in 1963 than in the 8 previous years combined.

Since May 1954, about 1,500 bluefin tuna, 4,350 Atlantic sailfish, 2,350 white marlin, 950 Pacific sailfish, 600 striped marlin, 200 blue and black marlins, 750 greater amberjack, 200 yellowfin tuna, and 875 other fish have been marked--a grand total of nearly 12,000 fish. Returns have been obtained from 32 bluefin tuna, 31 Atlantic sailfish, 3 white marlin, 1 striped marlin, 70 greater amberjack, 2 yellowfin tuna (from only 6 Pacific taggings), 7 striped bass, 5 crevalle jack, 1 bar jack, 3 dolphin, 2 great barracuda, 1 fluke, and 1 sea bass--a total of 159 returns.

Participation by individuals and clubs continues to increase, the Institution reports. Acknowledged is the valuable cooperation from the U. S. Bureau of Commercial Fisheries in marking fish and also in recovering tags with the necessary data. Assistance in the latter endeavor has also been furnished by the Inter-American Tropical Tuna Commission and by the Cape Cod Tuna Corporation, Eastport, Maine, and the Maryland Tuna Corporation, Cambridge, Md. Basic financial support for the program is from the National Science Foundation, supplemented by grants from the Charles W. Brown, Jr. Memorial Foundation, the National Geographic Society, the Sport Fishing Institute, the International Game Fish Association, the Van Camp Foundation, the Associates of the Woods Hole Oceanographic Institution, and numerous other organizations and individuals.

Increased tagging of Atlantic bluefin tuna in all possible areas is the Institution's most urgent objective at present. The importance of prompt and accurate reporting of taggings is emphasized. Some very important returns have proved of dubious value due to lack of tagging data.



U. S. Fishing Vessels

FISHERIES LOANS AND OTHER FINANCIAL AID FOR VESSELS, OCTOBER 1-DECEMBER 31, 1963:

From the beginning of the program in 1956 through December 31, 1963, a total of 1,341 loan applications for \$35,872,047 were received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. Of the total, 689 applications (\$15,737,240) have been approved,

459 (\$11,531,721) have been declined or found ineligible, 157 (\$6,084,422) have been withdrawn by applicants before being processed, and 36 (\$842,733) are pending. Of the applications approved, 273 were approved for amounts less than applied for. The total reduction was \$1,675,931.

The following loans were approved from October 1, 1963, through December 31, 1963:

New England and Middle Atlantic Areas: Bradford Reed, Boothbay Harbor, Maine, \$1,800; Silver Sea, Inc., Boston, Mass., \$25,000; Agatha and Patricia, Inc., Medford, Mass., \$50,000; Dias Fishing Corp., New Bedford, Mass., \$18,296; and Peter Edson Sprague, Narragansett, R. I., \$32,000.

California Area: Michael F. Schroeder, Aptos, \$5,365; Dean Holder, Crescent City, \$6,000; and Donald E. Dodson, Santa Cruz, \$20,000.

Pacific Northwest Area: Frank A. Taylor, Newport, Oregon, \$3,000.

Alaska Area: Fred L. Birch, Auke Bay, \$3,472; Albert Lauth, Craig, \$2,600; and Walter R. and Leota Farmer, Valdez, \$6,000.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the last quarter of 1963, 6 applications for \$330,162 were received and 1 application for \$36,412 was approved. Since the program began (July 5, 1960), 36 applications were received for \$3,889,129. Of the total, 28 applications were approved for \$2,359,046 and 8 applications for \$1,503,750 were pending as of December 31, 1963. Since the mortgage program began, applications received and approved by area are:

New England Area: Received 10 (\$1,025,365), approved 8 (\$775,365);

California: Received and approved 1 (\$557,000);

South Atlantic and Gulf Area: Received 18 (\$780,468), approved 12 (\$437,164);

Pacific Northwest: Received 6 (\$1,486,296), approved 4 (\$507,546);

Alaska: Received 1 (\$40,000). Not yet approved.

No applications for the Fishing Vessel Construction Differential Subsidy were re-

ceived from July through December 31, 1963, as the authority to accept applications expired on June 12, 1963. Since the beginning of that program on June 12, 1960, 13 applications were received for \$1,101,770, of which 6 applications were approved for \$546,103, and 7 applications for \$555,667 were pending.

* * * * *

DOCUMENTATIONS ISSUED AND CANCELLED:

November 1963: During November 1963, a total 37 vessels of 5 net tons and over was issued first documents as fishing craft, as

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, November 1963 with Comparisons

| Area (Home Port) | Nov. | | Jan.-Nov. | | Total |
|---------------------------------------|-----------|-----------|------------|------------|------------|
| | 1963 | 1962 | 1963 | 1962 | |
| (Number) | | | | | |
| Issued first documents 2/: | | | | | |
| New England | 1 | 2 | 21 | 27 | 28 |
| Middle Atlantic | 1 | - | 17 | 2 | 3 |
| Chesapeake | 6 | 6 | 60 | 41 | 43 |
| South Atlantic | 6 | 6 | 71 | 46 | 47 |
| Gulf. | 20 | 12 | 229 | 106 | 110 |
| Pacific | 2 | 5 | 152 | 127 | 130 |
| Great Lakes | 1 | 1 | 5 | 5 | 5 |
| Puerto Rico | - | 2 | 2 | 2 | 2 |
| Total | 37 | 34 | 557 | 356 | 368 |
| Removed from documentation 3/: | | | | | |
| New England | 2 | 1 | 43 | 20 | 24 |
| Middle Atlantic | 2 | 1 | 44 | 34 | 39 |
| Chesapeake | 4 | 1 | 23 | 23 | 23 |
| South Atlantic | 2 | 3 | 49 | 38 | 38 |
| Gulf. | 11 | 3 | 111 | 98 | 104 |
| Pacific | 7 | 11 | 82 | 103 | 111 |
| Great Lakes | 1 | 3 | 14 | 21 | 22 |
| Hawaii | - | - | 3 | 3 | 3 |
| Puerto Rico | - | - | - | 1 | 1 |
| Total | 29 | 23 | 369 | 341 | 365 |

1/For explanation of footnotes, see table 2.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, November 1963

| Gross Tonnage | Issued 2/ | | Cancelled 3/ | |
|--------------------|----------------------|--|--------------|--|
| | (Number) | | | |
| 5-9 | 6 | | 9 | |
| 10-19 | 8 | | 8 | |
| 20-29 | 3 | | 5 | |
| 30-39 | 1 | | - | |
| 40-49 | 1 | | 2 | |
| 50-59 | - | | 2 | |
| 60-69 | 3 | | - | |
| 70-79 | 12 | | - | |
| 80-89 | 1 | | 3 | |
| 290-299 | 1 | | - | |
| 450-459 | 1 | | - | |
| Total | 37 | | 29 | |

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes 2 redocumented vessels in November 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 27 in 1963; 1 in 1956; and 9 prior to 1951.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

compared with 34 in November 1962. There were 29 documents cancelled for fishing vessels in November 1963 as compared with 23 in November 1962.

* * * * *

October 1963: During October 1963, a total of 36 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 25 in October 1962. There were 28 documents cancelled for fishing vessels in October 1963 as compared with 30 in October 1962.

| Area (Home Port) | Oct. | | Jan.-Oct. | | Total 1962 |
|---|----------------------|-----------|------------|------------|---------------|
| | 1963 | 1962 | 1963 | 1962 | |
| | (Number) | | | | |
| Issued first documents^{2/}: | | | | | |
| New England | 2 | 1 | 20 | 25 | 28 |
| Middle Atlantic | - | - | 16 | 2 | 3 |
| Chesapeake | 9 | 6 | 54 | 35 | 43 |
| South Atlantic | 6 | 3 | 65 | 40 | 47 |
| Gulf | 15 | 7 | 209 | 94 | 110 |
| Pacific | 4 | 7 | 150 | 122 | 130 |
| Great Lakes | - | 1 | 4 | 4 | 5 |
| Puerto Rico | - | - | 2 | - | 2 |
| Total | 36 | 25 | 520 | 322 | 368 |
| Removed from documentation^{3/}: | | | | | |
| New England | 3 | - | 41 | 19 | 24 |
| Middle Atlantic | - | 2 | 42 | 33 | 39 |
| Chesapeake | 3 | 3 | 19 | 22 | 23 |
| South Atlantic | 2 | 6 | 47 | 35 | 38 |
| Gulf | 13 | 9 | 100 | 95 | 104 |
| Pacific | 7 | 10 | 75 | 92 | 111 |
| Great Lakes | - | - | 13 | 18 | 22 |
| Hawaii | - | - | 3 | 3 | 3 |
| Puerto Rico | - | - | - | 1 | 1 |
| Total | 28 | 30 | 340 | 318 | 365 |

^{1/}For explanation of footnotes, see table 2.

| Gross Tonnage | Issued ^{2/} | Cancelled ^{3/} |
|--------------------|----------------------|-------------------------|
| | (Number) | |
| 5-9 | 11 | 7 |
| 10-19 | 6 | 13 |
| 20-29 | 2 | 5 |
| 30-39 | - | 1 |
| 40-49 | 1 | 1 |
| 60-69 | 5 | - |
| 70-79 | 5 | 1 |
| 80-89 | 1 | - |
| 100-109 | 1 | - |
| 140-149 | 2 | - |
| 160-169 | 1 | - |
| 240-249 | 1 | - |
| Total | 36 | 28 |

^{1/}Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
^{2/}Includes 3 redocumented vessels in October 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 29 in 1963; 1 in 1962; 5 prior to 1951; and 1 unknown.
^{3/}Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
 Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U. S. Foreign Trade

IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-November 30, 1963, amounted to 48,238,342 pounds (about 2,297,064 std. cases), according to data compiled by the Bureau of Customs. This was 6.9 percent less than the 51,796,996 pounds (about 2,466,524 std. cases) imported during January 1-December 1, 1962.

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1963 at the 12½-percent rate of duty was limited to 63,130,642 pounds (or about 3,006,221 std. cases of 48 7-oz. cans). Any imports in excess of the quota were dutiable at 25 percent ad valorem.

* * * * *

IMPORTS OF FISH MEAL AND SCRAP BY CUSTOMS DISTRICTS, OCTOBER 1963:

U. S. imports of fish meal and scrap in October 1963 totaled 31,449 short tons, a decline of 9.3 percent from the 34,666 tons imported in the previous month, but a sharp increase from the 12,732 tons imported in October 1962.

About 87.9 percent of the fish meal and scrap imports in October 1963 entered through the Customs Districts of Maryland, Georgia, Mobile (Ala.), Galveston (Tex.), Los Angeles (Calif.), San Francisco (Calif.), and Washington.

| Customs Districts | October 1963 Short Tons |
|--|----------------------------|
| Maine and New Hampshire | 120 |
| Maryland | 6,338 |
| North Carolina | 1,378 |
| Georgia | 4,253 |
| Mobile (Ala.) | 4,435 |
| Sabine (Tex.) | 1,114 |
| Galveston (Tex.) | 2,989 |
| Los Angeles (Calif.) | 2,639 |
| San Francisco (Calif.) | 4,063 |
| Washington | 2,943 |
| Dakota | 195 |
| Duluth (Minn.) and Superior (Wis.) | 456 |
| Michigan | 397 |
| Other Customs Districts | 1/129 |
| Total | 31,449 |

^{1/}Includes 30 tons of fish meal classified as fertilizer.
 Note: A list of the entry ports included within each Customs District is given in Schedule D, Code Classification of United States Customs Districts and Ports, which may be obtained free from the Foreign Trade Division, Bureau of the Census, U. S. Department of Commerce, Washington, D. C. 20233.

* * * * *

TRENDS IN UNITED STATES EXPORTS OF FISHERY PRODUCTS BY COUNTRY, 1962:

In 1962, the annual value of United States exports increased slightly over 1961. The value of fishery products exported during 1962 was \$35,728,000, up 3 percent from the previous year.

Table 1 - Value of United States Exports of Fishery Products, 1953-1962

| Year | Edible | Inedible | Total |
|------|-------------------------|----------|--------|
| | (US\$1,000) | | |
| 1962 | 22,470 | 13,258 | 35,728 |
| 1961 | 19,594 | 15,116 | 34,710 |
| 1960 | 25,622 | 18,543 | 44,165 |
| 1959 | 26,747 | 17,495 | 44,242 |
| 1958 | 19,440 | 11,564 | 31,004 |
| 1957 | 20,549 | 15,403 | 35,952 |
| 1956 | 22,939 | 16,564 | 39,503 |
| 1955 | 24,923 | 15,054 | 39,977 |
| 1954 | 16,238 | 15,289 | 31,527 |
| 1953 | 17,084 | 10,794 | 27,878 |

Trend by Countries: During 1962, U.S. fishery products were exported to 103 countries. Of total exports, 63 percent was shipped to five countries: Canada, United Kingdom, Netherlands, Switzerland, and West Germany (table 2).

Table 2 - United States Exports of Fishery Products by Selected Countries of Destination, 1958-62

| Country | 1962 | 1961 | 1960 | 1959 | 1958 |
|------------------------|-------------------------|---------------|---------------|---------------|---------------|
| | (US\$1,000) | | | | |
| Canada | 8,846 | 10,265 | 10,309 | 8,644 | 9,200 |
| United Kingdom | 8,249 | 4,554 | 8,460 | 8,928 | 5,785 |
| Netherlands | 2,273 | 2,385 | 4,350 | 4,352 | 2,007 |
| Switzerland | 1,712 | 738 | 1,082 | 762 | 387 |
| West Germany | 1,467 | 1,555 | 2,201 | 2,888 | 3,043 |
| Sweden | 1,076 | 1,665 | 2,613 | 3,176 | 681 |
| France | 1,073 | 1,007 | 1,048 | 766 | 68 |
| Japan | 939 | 2,984 | 3,295 | 928 | 501 |
| Italy | 869 | 423 | 643 | 303 | 158 |
| Belgium and Luxembourg | 547 | 351 | 537 | 746 | 948 |
| Greece | 487 | 364 | 313 | 306 | 136 |
| Norway | 403 | 2,390 | 1,390 | 1,296 | 1,063 |
| Hong Kong | 383 | 368 | 269 | 229 | 127 |
| Mexico | 375 | 459 | 616 | 663 | 393 |
| Philippines | 320 | 582 | 2,494 | 5,587 | 2,578 |
| Venezuela | 274 | 360 | 461 | 614 | 641 |
| Cuba | 243 | - | 175 | 787 | 490 |
| Australia | 198 | 458 | 444 | 157 | 31 |
| Ecuador | 171 | 82 | 293 | 193 | 236 |
| Other | 5,823 | 3,720 | 3,172 | 2,917 | 2,531 |
| Total | 35,728 | 34,710 | 44,165 | 44,242 | 31,004 |

CANADA: Canada has been the principal market for United States fishery products. In 1962, Canada took products valued at \$8,846,000 or about 25 percent of the total U.S. exports of fishery products. Fresh or frozen fish and shellfish made up most of the U.S. exports of fishery products to Canada. Some of the important commodities exported to Canada were:

| | 1962 | 1961 |
|---|--------------------|---------------------|
| Shrimp, fresh or frozen | \$2,081,000 | \$ 1,675,000 |
| Shrimp, canned | 1,462,000 | 1,570,000 |
| Seal furs | 1,024,000 | 1,777,000 |
| Fish, fresh or frozen | 766,000 | 891,000 |
| Fish, shellfish, and other marine animal products, inedible | 703,000 | 703,000 |
| Shellfish, fresh or frozen | 1,874,000 | 2,928,000 |
| Other | 936,000 | 722,000 |
| Total | \$8,846,000 | \$10,266,000 |

UNITED KINGDOM: In 1962, exports to the United Kingdom rose to the 1959 and 1960 level of \$8,000,000, an

81-percent increase over 1961. Sharp increases in the major commodities accounted for this rise as fish oil alone more than doubled in value. Major fishery commodities exported to the United Kingdom were:

| | 1962 | 1961 |
|-----------------------------|--------------------|--------------------|
| Salmon, canned | \$5,622,000 | \$3,056,000 |
| Fish and marine-animal oils | 1,511,000 | 568,000 |
| Shrimp, canned | 682,000 | 557,000 |
| Salmon, fresh or frozen | 138,000 | 141,000 |
| Other | 296,000 | 232,000 |
| Total | \$8,249,000 | \$4,554,000 |

OTHER COUNTRIES: Exports to Norway, Sweden, Netherlands, and West Germany consisted mainly of fish oils. Switzerland took largely seal furs. Principal products exported to Japan were frozen shrimp and unmanufactured shells. France received significant amounts of frozen salmon and canned and frozen shellfish.

Trend by Areas: During 1962, Europe remained the principal destination for fishery products exported from the United States (table 3). Products valued at \$18,800,000 or 53 percent of total exports went to Europe. North America was second with \$10,856,000 or 30 percent.

Table 3 - United States Exports of Fishery Products by Area of Destination, 1962

| Area | Edible | Inedible | Total |
|---------------|-------------------------|---------------|---------------|
| | (US\$1,000) | | |
| North America | 8,104 | 2,752 | 10,856 |
| Asia | 2,234 | 1,385 | 3,619 |
| Europe | 9,957 | 8,843 | 18,800 |
| South America | 572 | 135 | 707 |
| Africa | 1,220 | 97 | 1,317 |
| Oceania | 383 | 46 | 429 |
| Total | 22,470 | 13,258 | 35,728 |

Trend by Commodities: Canned salmon was the principal dollar earner among U.S. fishery exports. Fish oil was second in importance. Exports of seal furs showed some gain with Canada and Switzerland taking 65 percent of the total.

Table 4 - Value of United States Exports of Fishery Products by Selected Commodities, 1958-62

| Commodity | 1962 | 1961 | 1960 | 1959 | 1958 |
|--|-------------------------|-------|--------|--------|-------|
| | (US\$1,000) | | | | |
| Fish oils | 6,047 | 8,908 | 10,688 | 11,902 | 7,761 |
| Seal furs | 3,851 | 3,097 | 3,309 | 2,580 | 1,511 |
| Shells, unmanufactured | 1,285 | 1,380 | 2,636 | 977 | 624 |
| Miscellaneous fish (mostly fresh-water), fresh or frozen | 1,135 | 809 | 947 | 622 | 1,036 |
| Oysters, shucked | 311 | 448 | 497 | 575 | 567 |
| Salmon: | | | | | |
| Fresh | 872 | 647 | 1,677 | 659 | 476 |
| Cured | 528 | 593 | 435 | 372 | 357 |
| Canned | 7,292 | 5,580 | 9,830 | 10,639 | 6,669 |
| Mackerel, canned | 671 | 581 | 211 | 135 | 333 |
| Miscellaneous fish (mostly California anchovies), canned | 460 | 391 | 355 | 326 | 496 |
| Sardines, canned not in oil | 1,285 | 1,336 | 3,443 | 5,843 | 3,231 |
| Shrimp: | | | | | |
| Fresh or frozen | 3,299 | 3,694 | 2,303 | 1,682 | 1,463 |
| Canned | 2,572 | 2,487 | 3,383 | 2,898 | 2,548 |
| Squid, canned | 729 | 353 | 691 | 906 | 501 |

TRENDS IN UNITED STATES FISHERY IMPORTS, BY COUNTRY 1962:

The value of annual imports of fishery products entering the United States increased to a new high in 1962. In that year, 113 countries shared in the United States market for fishery products. The value of fishery products imported was \$475,248,000--19.7 percent over the 1961 value. The imports of edible fishery products amounted to \$400,882,000; inedible \$74,366,00.

Trend by Countries: Canada, Japan, and Mexico continued to be the leading suppliers of fishery products to the United States (table 1). These countries accounted for 58 percent of the value of fishery imports. Canada provided 24 percent of the total, Japan 22 percent, and Mexico 11 percent. Peru, South Africa Republic, Norway, Australia, and Iceland were the next leading suppliers with imports ranging from \$11,000,000 to \$24,000,000. Imports from Brazil, El Salvador, Ecuador, Panama, Portugal, India, and Denmark, each were valued over \$5,000,000.

CANADA: Canada, with fishery products valued at \$116,168,000, continued to be the principal supplier of fishery products to the United States. The value of fishery imports increased 7.5 percent over 1961. Leading commodities were as follows:

| | 1962 | 1961 |
|---|----------------------|----------------------|
| Fresh or frozen: | | |
| Lobster | \$ 15,000,000 | \$ 14,570,000 |
| Fresh-water fish | 11,737,000 | 12,173,000 |
| Fish blocks | 15,162,000 | 14,294,000 |
| Groundfish fillets | 12,526,000 | 11,581,000 |
| Salmon | 5,298,000 | 5,860,000 |
| Halibut | 7,791,000 | 6,133,000 |
| Flounder fillets | 5,422,000 | 5,210,000 |
| Fresh-water fillets | 2,187,000 | 5,404,000 |
| Scallops | 4,810,000 | 3,322,000 |
| Other fresh or frozen | 7,310,000 | 5,110,000 |
| Canned lobster | 5,507,000 | 4,682,000 |
| Fish meal and scrap | 5,193,000 | 3,544,000 |
| Cod, haddock, etc., pickled or salted | 6,698,000 | 7,420,000 |
| Other fishery products | 11,527,000 | 8,732,000 |
| Total | \$116,168,000 | \$108,035,000 |

JAPAN: The value of fishery imports from Japan was \$105,246,000, an increase of 19 percent over 1961. Tuna and pearls remained the leading commodities. U.S. imports of fishery products from Japan were as follows:

| | 1962 | 1961 |
|------------------------------------|----------------------|---------------------|
| Fresh or frozen: | | |
| Albacore | \$ 9,759,000 | \$ 8,544,000 |
| Albacore loins and discs | 669,000 | 1,127,000 |
| Other tuna | 16,025,000 | 9,462,000 |
| Other loins and discs | 3,118,000 | 1,626,000 |
| Shrimp | 2,740,000 | 1,201,000 |
| Swordfish | 6,232,000 | 6,391,000 |
| Fresh-water trout | 747,000 | 776,000 |
| Frog legs | 1,362,000 | 740,000 |
| Canned: | | |
| Light meat tuna in brine | 12,053,000 | 11,269,000 |
| White meat tuna in brine | 7,912,000 | 7,487,000 |
| Salmon | 2,238,000 | 2,667,000 |
| Crab meat | 4,635,000 | 5,756,000 |
| Clams | 809,000 | 972,000 |
| Pearls, cultivated | 17,934,000 | 16,136,000 |
| Other | 19,013,000 | 14,107,000 |
| Total | \$105,246,000 | \$88,261,000 |

MEXICO: Mexico ranked third as a supplier of fishery products to the United States. Shrimp was the principal commodity. Mexico furnished 51 percent of the total value of all U.S. shrimp imports. The value of imports from Mexico is:

| | 1962 | 1961 |
|------------------------|---------------------|---------------------|
| Shrimp | \$46,700,000 | \$40,094,000 |
| Other | 6,827,000 | 5,672,000 |
| Total | \$53,527,000 | \$45,766,000 |

OTHER COUNTRIES: Other leading suppliers of fishery products to the United States market are listed below showing the principal product shipped and the value of U.S. imports of that product:

| | |
|--|--------------|
| South Africa Republic - Rock lobster tails | \$14,277,000 |
| Peru - Fish meal | 16,828,000 |
| Australia - Lobster, frozen | 13,867,000 |
| Panama - Shrimp | 7,787,000 |
| Norway - Sardines in oil, not skinned | 7,625,000 |
| El Salvador - Shrimp | 4,982,000 |
| Brazil - Rock lobster tails | 4,538,000 |
| Ecuador - Shrimp | 1,823,000 |
| Portugal - Sardines in oil, skinned | 3,001,000 |

Area of Origin: During 1962, North American countries continued to be the principal source of supply for fishery products imported into the United States (table 2).

Products valued at \$192,624,000 or 41 percent of total fishery imports came from North American sources. Imports from Asian countries were second, Europe third.

Table 1 - Value of United States Imports of Fishery Products (Edible and Inedible) by Selected Countries of Origin, 1962 1/

| Country | 1962 | 1961 | 1960 | 1959 | 1958 |
|--------------------------|----------------|----------------|----------------|----------------|----------------|
| | (US\$1,000) | | | | |
| Canada | 116,168 | 108,035 | 102,877 | 101,967 | 107,005 |
| Japan | 105,246 | 88,263 | 85,256 | 96,226 | 84,872 |
| Mexico | 53,527 | 45,766 | 36,705 | 32,869 | 28,005 |
| Peru | 24,819 | 16,729 | 14,270 | 16,374 | 10,907 |
| So. Afr. Rep. | 19,688 | 14,468 | 12,030 | 12,090 | 9,332 |
| Norway | 18,937 | 15,101 | 12,506 | 16,405 | 12,087 |
| Australia | 14,884 | 10,856 | 9,839 | 8,180 | 7,665 |
| Iceland | 11,602 | 11,528 | 9,306 | 10,000 | 8,775 |
| Repub. of Pan | 7,884 | 6,707 | 5,767 | 6,458 | 5,852 |
| Brazil | 6,825 | 5,074 | 3,916 | 3,002 | 2,359 |
| Denmark | 6,553 | 5,246 | 4,342 | 8,239 | 5,728 |
| Ecuador | 6,443 | 4,619 | 4,467 | 4,159 | 3,510 |
| Portugal | 5,983 | 6,525 | 5,289 | 5,452 | 5,177 |
| India | 5,638 | 2,777 | 2,363 | 2,239 | 1,547 |
| El Salvador | 5,100 | 5,510 | 4,215 | 1,297 | 660 |
| W. Germany | 4,499 | 4,160 | 4,100 | 1,814 | 1,805 |
| Netherlands | 2,997 | 1,736 | 2,562 | 2,628 | 1,509 |
| France | 2,457 | 2,087 | 2,317 | 2,230 | 1,169 |
| United Kingdom | 2,520 | 2,309 | 1,759 | 2,388 | 1,787 |
| Chile | 2,155 | 2,089 | 2,630 | 1,282 | 2,007 |
| Angola | 554 | 500 | 267 | 3,023 | 2,065 |
| Cuba | 98 | 1,793 | 3,901 | 4,810 | 5,542 |
| Other | 50,671 | 35,180 | 29,381 | 23,368 | 17,806 |
| Total | 475,248 | 397,058 | 360,065 | 366,500 | 327,171 |

1/Value at the foreign port of shipment.

Table 2 - Value of United States Imports of Fishery Products, by Area of Origin, 1962 1/

| Area | Edible | Inedible | Total |
|-------------------------|----------------|---------------|----------------|
| | (US\$1,000) | | |
| North America | 184,885 | 7,739 | 192,624 |
| South America | 30,493 | 23,114 | 53,607 |
| Europe | 51,177 | 10,504 | 61,681 |
| Asia | 89,551 | 29,979 | 119,530 |
| Oceania | 20,727 | 480 | 21,207 |
| Africa | 24,049 | 2,550 | 26,599 |
| Total | 400,882 | 74,366 | 475,248 |

1/Value at the foreign port of shipment.

Table 3 - Value of United States Imports of Fishery Products, by Selected Commodities, 1958-62 1/

| Commodity | 1962 | 1961 | 1960 | 1959 | 1958 |
|------------------------------------|----------------|----------------|----------------|----------------|----------------|
|(US\$1,000)..... | | | | | |
| Edible Products: | | | | | |
| Fresh or frozen: | | | | | |
| Shrimp..... | 91,898 | 68,538 | 56,406 | 52,306 | 43,162 |
| Tuna..... | 45,715 | 30,228 | 31,713 | 29,728 | 25,377 |
| Groundfish fillets and blocks | 46,937 | 42,595 | 33,265 | 38,759 | 30,431 |
| Lobster..... | 57,182 | 49,039 | 44,768 | 38,635 | 35,661 |
| Other..... | 71,822 | 63,547 | 61,845 | 60,940 | 63,243 |
| Total fresh or frozen | 313,554 | 253,947 | 227,997 | 220,368 | 197,874 |
| Canned: | | | | | |
| Tuna..... | 22,884 | 22,175 | 19,142 | 21,688 | 16,882 |
| Salmon..... | 3,435 | 3,545 | 7,541 | 11,130 | 11,271 |
| Sardines..... | 16,291 | 12,543 | 9,115 | 8,370 | 8,564 |
| Crab meat..... | 4,701 | 5,780 | 5,514 | 7,947 | 6,116 |
| Lobster..... | 5,811 | 4,779 | 5,239 | 6,441 | 3,952 |
| Other..... | 18,878 | 17,530 | 16,067 | 17,083 | 15,561 |
| Total canned | 72,000 | 66,352 | 62,618 | 72,659 | 62,346 |
| Other edible products | 15,328 | 15,458 | 16,765 | 18,006 | 19,992 |
| Inedible products: | | | | | |
| Fish meal..... | 24,298 | 16,740 | 11,068 | 15,884 | 11,335 |
| Pearls..... | 18,935 | 16,925 | 14,563 | 13,678 | 10,944 |
| Other..... | 31,133 | 27,636 | 27,054 | 25,905 | 24,680 |
| Total inedible | 74,366 | 61,301 | 52,685 | 55,467 | 46,959 |
| Total fishery imports | 475,248 | 397,058 | 360,065 | 366,500 | 327,171 |

1/Value at the foreign port of shipment.

Duties Collected: Duties collected on imports of fishery products into the United States during 1962 were \$17,910,000 or 6 percent higher than in 1961. Duties collected (with the average ad valorem equivalent) for the years 1958-62 are listed below:

| Year | Duties Collected | Average Ad valorem Equivalent (Percent) |
|------|------------------|---|
| 1962 | \$17,910,000 | 3.8 |
| 1961 | 16,904,000 | 4.3 |
| 1960 | 15,837,000 | 4.4 |
| 1959 | 17,737,000 | 4.8 |
| 1958 | 16,645,000 | 5.1 |



Wholesale Prices

EDIBLE FISH AND SHELLFISH, DECEMBER 1963:

The December 1963 wholesale price index for edible fish and shellfish (fresh, frozen, and canned) rose 1.3 percent from the previous month as a result of higher prices for most fishery products. Compared with December 1962, the index in December 1963 at 107.5 percent of the 1957-59 average was lower by 11.1 percent. Prices during the same month a year earlier were substantially higher for nearly all items in the index.

The drawn, dressed, or whole finfish subgroup index dropped 2.2 percent from November to December 1963 and



was down 14.0 percent from December 1962. Prices at New York this December were lower for frozen dressed king salmon (down 4.8 percent) and frozen western dressed halibut (down about 1.0 percent). A sharp drop in prices for fresh Lake Superior whitefish (down 26.8 percent) at Chicago was partly offset by higher prices for Great Lakes round yellow pike at New York and an increase in prices for ex-vessel large haddock (up 6.7 percent) at Boston because of lighter landings. Compared with December 1962, wholesale prices in December 1963 were lower for all products in the subgroup—halibut (down 24.4 percent), king salmon (down 12.7 percent), fresh large haddock (down 7.5 percent), and Lake Superior whitefish (down 40.6 percent).

Higher prices in December 1963 for South Atlantic fresh shrimp (up 12.4 percent) at New York City and for fresh haddock fillets (up 5.3 percent) at Boston were responsible for a 4.0-percent increase from the previous month in the subgroup index for processed fresh fish and shellfish. December prices for standard shucked oysters at Norfolk were down 3.2 percent from the previous month as production got into full swing. Compared with December 1962, fresh shrimp prices in December 1963 were down 22.4 percent. Prices for other items in the subgroup also were lower than a year earlier bringing the December 1963 subgroup index down by 13.2 percent.

Higher prices in December 1963 for all processed frozen fish and shellfish products caused a 2.7-percent increase from the previous month in the subgroup index. A rising trend in frozen shrimp prices (wholesale price up 2 cents a pound at Chicago) was indicated in December 1963 although those prices were still sharply lower (down 24.8 percent) than a year earlier. Prices for small haddock fillets and ocean perch fillets also rose from November to December because of seasonally light landings. The December 1963 subgroup index was down 13.0 percent from the same month a year earlier mainly because of lower frozen shrimp prices and a slight drop in prices for flounder fillets.

Prices for canned fish products were generally higher in December 1963 as a result of low end-of-the-year stocks and the subgroup index rose 1.3 percent from the previous month. As compared with December 1962, prices in December 1963 were lower for all canned fish and the subgroup index was down by 6.3 percent.

| Wholesale Average Prices and Indexes for Edible Fish and Shellfish, December 1963 with Comparisons | | | | | | | | |
|--|------------------|------|--------------------------------|-----------|-----------------------|-----------|-----------|-----------|
| Group, Subgroup, and Item Specification | Point of Pricing | Unit | Avg. Prices ^{1/} (\$) | | Indexes (1957-59=100) | | | |
| | | | Dec. 1963 | Nov. 1963 | Dec. 1963 | Nov. 1963 | Oct. 1963 | Dec. 1962 |
| ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) | | | | | 107.5 | 106.1 | 106.8 | 120.9 |
| Fresh & Frozen Fishery Products: | | | | | 110.5 | 109.0 | 110.0 | 127.6 |
| Drawn, Dressed, or Whole Fish: | | | | | 114.4 | 117.0 | 121.6 | 133.1 |
| Haddock, lge., offshore, drawn, fresh | Boston | lb. | .17 | .16 | 133.0 | 124.7 | 104.0 | 143.8 |
| Hallibut, West., 20/80 lbs., drsd., fresh or froz. | New York | lb. | .33 | .33 | 96.1 | 97.1 | 129.9 | 127.1 |
| Salmon, king, lge. & med., drsd., fresh or froz. | New York | lb. | .85 | .89 | 118.0 | 124.0 | 132.7 | 135.2 |
| Whitefish, L. Superior, drawn, fresh | Chicago | lb. | .41 | .56 | 61.2 | 83.6 | 78.3 | 103.0 |
| Yellow pike, L. Michigan & Huron, rnd., fresh | New York | lb. | .51 | .46 | 83.5 | 75.3 | 83.5 | 83.5 |
| Processed, Fresh (Fish & Shellfish): | | | | | 111.5 | 107.2 | 106.6 | 128.5 |
| Fillet, haddock, sml., skins on, 20-lb. tins | Boston | lb. | .57 | .54 | 138.0 | 131.1 | 114.1 | 139.6 |
| Shrimp, lge. (26-30 count), headless, fresh | New York | lb. | .82 | .73 | 95.5 | 85.0 | 87.9 | 123.1 |
| Oysters, shucked, standards | Norfolk | gal. | 7.50 | 7.75 | 126.5 | 130.7 | 128.6 | 132.8 |
| Processed, Frozen (Fish & Shellfish): | | | | | 101.3 | 98.6 | 97.5 | 116.4 |
| Fillet, flounder, skidless, 1-lb. pkg. | Boston | lb. | .39 | .39 | 98.9 | 98.9 | 100.1 | 100.1 |
| Haddock, sml., skins on, 1-lb. pkg. | Boston | lb. | .40 | .38 | 115.8 | 111.4 | 114.3 | 107.0 |
| Ocean perch, lge., skins on 1-lb. pkg. | Boston | lb. | .35 | .34 | 121.0 | 119.2 | 118.4 | 117.5 |
| Shrimp, lge. (26-30 count), brown, 5-lb. pkg. | Chicago | lb. | .78 | .76 | 91.9 | 89.5 | 86.0 | 122.2 |
| Canned Fishery Products: | | | | | 102.5 | 101.2 | 101.7 | 109.4 |
| Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. | Seattle | cs. | 23.50 | 23.25 | 102.4 | 101.3 | 102.4 | 111.1 |
| Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. | Los Angeles | cs. | 11.06 | 10.88 | 98.2 | 96.6 | 96.6 | 104.4 |
| Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs. | Los Angeles | cs. | 5.75 | 5.75 | 97.5 | 97.5 | 97.5 | 2/100.0 |
| Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. | New York | cs. | 8.96 | 8.84 | 114.9 | 113.3 | 113.3 | 119.4 |

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

^{2/}New product replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.



DDT RESISTANCE SEEN IN MINNOW-LIKE FISH

Mosquitofish (*Gambusia affinis*), a top-feeding minnow found in the southern United States and other warm climates, is believed to be the first fish to demonstrate an apparent resistance to DDT. Mosquitofish are valuable in the destruction of mosquito larvae because of their surface feeding habits.

Three Mississippi scientists reported that mosquitofish from waters near cotton fields that had been longtreated with chlorinated hydrocarbon pesticides showed a marked resistance to DDT compared with fish from areas where insecticides had not previously been used. They tested 1,175 fish.

In the past mosquitofish usually died within a few hours after exposure to DDT. Among vertebrates, fish are notable for their susceptibility to pesticides, although resistance among insects is quite common, and two species of frogs have been found resistant.

Scientists from Mississippi State University, said "one could easily imagine that a genetically resistant population (of mosquitofish) might result from periodic applications of insecticide." (Science News Letter, 83:73, February 2, 1963.)



International

EUROPEAN FISHERIES CONFERENCE

MEETING OPENS IN LONDON:

The European Fisheries Conference met in London December 3-6, 1963, and then adjourned until January 8, 1964. The British Government had invited 16 nations to the conference, including the member countries of the European Free Trade Association (EFTA) and the European Economic Community (EEC) as well as Iceland, the Irish Republic, and Spain. The following statement was issued after adjournment of the December talks:



"At the invitation of Her Majesty's Government, a conference met in London from the third to the sixth of December to discuss the solution on a European basis of certain fisheries problems.

"The conference discussed the following agenda: (1) freedom of fishing and access to fishing grounds, (2) access to markets, (3) fisheries policing, and (4) miscellaneous.

"Particular attention was given to the possibility of reaching agreed arrangements on access to fishing grounds. The desirability of establishing the conditions for liberal trade policies for fish was emphasized. The conference recognized the importance of effective conservation measures in the common interest. There was general agreement on the need for devising a modern code governing the conduct of fishing operations to bring up to date on a wider basis the provisions of the North Sea Fisheries Convention of 1882.

"On access to fishing grounds, proposals for defining the regime that might govern extensions of fishery jurisdiction were put forward by certain delegations. In order to give time for further study of these proposals and of other proposals made under other items of the agenda, the conference adjourned on Friday, December 6, until the 8th of January, 1964, when it will continue its discussions with the same agenda."

(Editor's Note: The British Government issued the invitation for the European Fisheries Conference in the spring of 1963 at the same time that it announced its intention to withdraw from certain international fishery agreements which limited its freedom of action regarding the extension of fishing limits.)

Note: See Commercial Fisheries Review, July 1963 p. 95.

FISH MEAL

PRODUCTION, AUGUST-OCTOBER 1963:

World fish meal production in August-October 1963 totaled 470,192 metric tons (163,310 tons in August, 152,775

| Country | Aug.-Oct. | | Jan.-Oct. | |
|--------------------------------------|----------------|----------------|------------------|------------------|
| | 1963 | 1962 | 1963 | 1962 |
|(Metric Tons)..... | | | | |
| Canada | 21,338 | 15,639 | 64,583 | 64,832 |
| Denmark | 28,229 | 34,218 | 87,170 | 84,788 |
| France | 3,300 | 3,300 | 11,000 | 11,000 |
| German Federal Rep. | 19,211 | 18,681 | 63,792 | 61,998 |
| Netherlands | 1/ | 1,400 | 2/ 1,900 | 4,300 |
| Spain | 6,153 | 5,896 | 17,022 | 21,725 |
| Sweden | 1,843 | 1,252 | 5,174 | 3,758 |
| United Kingdom | 17,617 | 17,261 | 63,716 | 62,196 |
| United States | 75,822 | 94,097 | 192,020 | 255,044 |
| Angola | 6,854 | 9,108 | 21,394 | 24,666 |
| Iceland | 32,383 | 41,338 | 78,267 | 92,762 |
| Norway | 40,164 | 40,061 | 109,907 | 107,239 |
| Peru | 162,690 | 209,480 | 903,437 | 819,638 |
| So. Afr. (incl. S.W. Afr.) | 54,588 | 20,437 | 233,072 | 200,753 |
| Total | 470,192 | 512,168 | 1,852,454 | 1,814,699 |

1/Data not available.

2/Data available only for January-June.

Note: Belgium, Chile, Japan, and Morocco do not report their fish meal production to the International Association of Fish Meal Manufacturers at present.

International (Contd.):

tons in September, and 154,107 tons in October), according to preliminary data from the International Association of Fish Meal Manufacturers. Production in August-October 1963 was down 8.2 percent from that in the same period of 1962. The decline was due mainly to small output in Peru, the United States, Iceland, and Denmark, which was only partly offset by greater production in South Africa and Canada.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

World fish meal production during the first 10 months of 1963 was only about 2.1 percent greater than in the same period of the previous year. Production in 1963 was boosted by heavier landings of anchoveta in Peru and industrial fish in South Africa, but there was a sharp decline in production in the United States.

Peru accounted for 48.8 percent of total fish meal production during January-October 1963, followed by South Africa with 12.6 percent and the United States with 10.3 percent.

FOOD AND AGRICULTURE ORGANIZATION:

FISHERY PRODUCTS IN THE WORLD FOOD PROGRAM:

The United Nations (UN) and its specialized agency, the Food and Agriculture Organization (FAO), have a joint World Food Program for the multilateral use and distribution of surplus foods. The initial experimental three-year program approved by the FAO Conference in November 1961, and shortly thereafter by the United Nations, has aimed at creating a fund of \$100 million in commodities, services, and cash contributed by member governments of the UN and FAO. An Intergovernmental Committee of 20 nations has been established to provide guidance on policy, administration, and operations. The Fourth Session of the Intergovernmental Committee was held in Rome, November 4-9, 1963.



As of October 31, 1963, donor countries had pledged about \$90 million in commodities, services, and cash to the World Food Program. Commodities committed or earmarked for delivery to recipient countries totaled \$27,330,000.

Fishery products have become an important part of the World Food Program. Of the commodities committed or earmarked for delivery so far, fishery products are the third most important category exceeded only by cereal and cereal products and dairy products. As of October 31, 1963, about 4,185 metric tons of canned and dried fish had been either earmarked or delivered (see table); those products were valued at \$1,935,000. The donor countries for dried fish have been Canada, Norway, the Federal Republic of Germany, India, and Belgium. The principal donor countries for canned fish have been the Netherlands, Sweden, Canada, and Norway. The fishery products donated have gone to a large number of countries in Africa, Asia, and Latin America.

Of the \$90 million so far pledged, the United States has agreed to donate \$40 million in commodities, \$4 million in shipping and services, and \$6 million in cash. Presently, the only United States agricultural products that are being earmarked for delivery are those held by the Commodity Credit Corporation. Authority for disposal of such products comes under Title II of Public Law 480. By an amendment to PL 480, fishery products will be eligible after January 1, 1965, under the provisions of Title I, and they were eligible as of December 16, 1963, under Title IV.

| World Food Program Fishery Products Pledged and Earmarked as of October 31, 1963 | | |
|--|--|---|
| Type of Fish and Donor Country | Earmarkings and Deliveries | |
| | Quantity | Country of Destination |
| | Metric Tons | |
| Dried fish: | | |
| Belgium | 38.0 300.0 | Togo Indonesia |
| Total | 338.0 | |
| Canada | 188.0 465.0 63.0 310.0 150.0 | Br. Guiana Pakistan Bolivia Colombia Indonesia |
| Total | 1,176.0 | |
| German Federal Republic | 146.0 64.0 10.0 5.7 65.0 92.0 | Tanganyika Ruanda Zanzibar Chile Korea Senegal |
| Total | 382.7 | |
| India | 38.0 200.0 35.0 33.0 | Korea Indonesia Pakistan Ceylon |
| Total | 306.0 | |
| Norway | 400.0 50.0 28.0 65.0 70.0 175.0 | Indonesia Tanganyika Bolivia Korea Tobago Jamaica |
| Total | 788.0 | |
| Total dried fish, | 2,990.7 | |
| Canned fish: | | |
| Canada | 110.0 | Br. Guiana |
| Tunisia | 30.0 | Ghana |
| Sweden | 280.0 169.0 | Ghana Iraq |
| Total | 449.0 | |
| Norway | 48.0 60.0 | Bolivia Ghana |
| Total | 108.0 | |
| Netherlands | 55.0 60.0 29.0 175.0 100.0 88.0 | Thailand Tobago Mauritania Jamaica Indonesia Sarawak |
| Total | 507.0 | |
| Total canned fish, | 1,204.0 | |
| Grand total, dried and canned fish | 4,194.7 | |

Note: Total value of dried and canned fish, as of October 31, 1963, was \$1,935,000.

* * * * *

International (Contd.):

**TWELFTH SESSION OF THE
FAO CONFERENCE:**

The Food and Agriculture Organization of the United Nations holds a biennial conference to enable its member countries to review past programs, consider and approve the program of work and budget for the coming two years, and to evaluate long-term trends and programs. There are now 106 full member countries of FAO and 6 associate members. The 12th Session of the FAO Conference, held in Rome, Italy, October 31 to December 5, 1963, began with meetings of six technical committees—one each for fisheries, forestry, agriculture, nutrition, economics, and information.

Government fisheries advisers on the United States Delegation to the 12th Session were H. E. Crowther, Deputy Di-

tee were the most productive of any held since the establishment of FAO.

Early in the discussions of the Technical Committee it became evident that a majority of the delegates were deeply concerned with the status of fisheries work in FAO. During the last decade, FAO has undergone reorganizations which have created a large number of divisions from the original five (Economics, Fisheries, Forestry, Nutrition, and Agriculture) that had been established in 1945 and 1946. The Fisheries Division has now become one of six divisions in the Technical Department. Also a Department of Economic and Social Services has been created with four divisions heavily engaged in agricultural work. With such a proliferation of divisions and departments, the Fisheries Division has become far removed from the Director-General's Office and has not received attention commensurate with the



Fishery advisers on the U. S. Delegation to the 12th Session of the FAO Conference. From left, Charles R. Carry, Executive Director, California Fish Canners Association; H. E. Crowther, Deputy Director, Bureau of Commercial Fisheries; and Sidney Shapiro, Chief, Branch of Foreign Fisheries, Bureau of Commercial Fisheries.

rector, Bureau of Commercial Fisheries, and Sidney Shapiro, Chief, Branch of Foreign Fisheries, Bureau of Commercial Fisheries. Charles R. Carry, Executive Director, California Fish Canners Association, served as industry adviser on the delegation. W. M. Chapman, Director of the Van Camp Foundation, attended the sessions of the Technical Committee on Fisheries as an observer.

Delegates from about 45 countries participated in the meetings of the Technical Committee on Fisheries. In past FAO Conferences representation at the technical meetings had been good, but many of the delegates had been either local embassy officers of their respective governments or agricultural representatives. The Technical Committee on Fisheries of the 12th Session was composed mainly of experienced fisheries men, and the meetings of the commit-

tee were the most productive of any held since the establishment of FAO. growing importance of fisheries in supplying high-quality protein to peoples in many parts of the world. Also, FAO's Fisheries Division has been taking a secondary role in international governmental and nongovernmental programs concerned with fishery research and development.

The United States representatives to the Technical Committee on Fisheries presented a statement which highlighted the Fisheries Division's difficulties and expressed the feeling among United States fisheries people that international activities related to the oceans and inland waters were not properly organized in the United Nations family in a manner that would insure maximum effectiveness. Representatives from many other countries strongly supported this statement, and expressed unanimous concern at what they considered was the inadequacy both of staff and funds available

International (Contd.):

to the Fisheries Division for dealing with problems within its constitutional rights. The representatives were also concerned with the inadequacy of the Division to assume its responsibility as coordinator of the fishery activities of the many international governmental and nongovernmental bodies that deal with problems related to fisheries, the solution of which is so essential for supplying the world with high-quality protein foods.

The Technical Committee on Fisheries drafted a resolution which was later approved by the full FAO Conference. This resolution has considerable importance for the long-term position of FAO's Fisheries Division, not only with regard to raising its status in FAO but to making it the leading intergovernmental body in encouraging rational harvesting of food from the oceans and inland waters. It is expected that proposals for reorganizing the Fisheries Division will be presented by the Director-General of FAO to the next meeting of the FAO Council, which is scheduled for September 1964 in Rome.

The Technical Committee on Fisheries, and later the FAO Conference, approved the 1964-65 program of work and budget proposed for the Fisheries Division by the Director-General. Included in that budget were four new professional positions (with supporting staff), as follows: (1) A marine fisheries biologist to handle the work of the Advisory Committee on Marine Resources Research and to work on specific matters such as tuna research and methods of determining fish abundance; (2) a fish processing technologist to work on the development of new fishery products; (3) a fish processing technologist to work on UNICEF-related projects; and (4) a fisheries economist to work on an expanded project for the development of protein production.

In addition to the approved budgeted posts, the Technical Committee on Fisheries and the FAO Conference approved strengthening of four additional areas of work: (1) Stock assessment studies and the analysis of catch, fishing effort, and biological statistics on whales, tunas, and other species; (2) development of management practices in the inland fisheries of developing countries; (3) fishing boat design; and (4) regional fisheries work in East Africa. The cost of the additional posts needed to conduct these four areas of work was estimated to be \$143,600 for the coming biennium.

The Conference approved a total FAO budget of \$38,838,300 for 1964-65, and requested that the Director-General make appropriate adjustments within FAO in order to take into account the requests for new posts that were submitted by all the Technical Committees, and approved by the full Conference. The total budget voted by the FAO Conference was an increase of about 25 percent over that approved for 1962-63. The budget allocation for the Fisheries Division (not taking into account the \$143,600 in new positions requested by the Technical Committee) is \$2,224,600 for the biennium 1964-65, or an increase of about 16.5 percent over that approved for the Division during 1962-63.

The FAO Conference also approved the holding during 1964-65 of a number of international meetings, many of interest and importance to the United States fisheries. In the field of fishery biology, the FAO Advisory Committee on Marine Resources Research will hold two meetings during the coming two years, and the Expert Panel for the Facilitation of Tuna Research will hold one meeting. A World Symposium on Fish Culture will also be held during this coming biennium. In the field of fishery technology, the following meetings were approved: A Technical Meeting on Boats Concerning Small Units for Developing Fisheries; a Symposium on the Significance of Fundamental Research in the Successful Utilization of Fish; a Symposium on Improved Fish Handling and Distribution, to be held in conjunction with the forthcoming 11th Session of the Indo-Pacific Fisheries Council; and participation in a joint FAO/CCTA Symposium on the Preservation and Distribution of Freshwater Fish in Africa. In the field of fishery economics and statistics, ap-

proval was given to convening in 1965 a World Meeting on Fishery Administration; holding early in 1964 in Australia a Seminar on Fishery Development Planning and Administration for the Indo-Pacific Region; and holding in 1964 a Meeting on Business Decisions in Fishery Industries.

RESOLUTION ON FISHERIES DEVELOPMENT: THE FAO CONFERENCE:

Realizing that the most pressing need in human nutrition is to make available to people in all parts of the world an adequate supply of high-quality protein such as that derived directly from animals;

Noting that whereas there are great difficulties in rapidly increasing supplies of animal protein in many parts of the world, the oceans and inland waters offer exceptional possibilities for meeting this urgent need;

Observing that world fisheries production has doubled within the past decade and that opportunities exist for comparable increases in the next several decades;

Noting the increased attention which, in recent years, has been given to the rational exploitation of the living resources of the oceans and inland waters by national and international governmental and nongovernmental bodies concerned with research, management, and development;

Emphasizing that wasteful duplication in international fishery work can be avoided only if all efforts are properly coordinated;

Recognizing the constitutional responsibility of FAO in this field, and the increasingly important role that the Fisheries Division should play in the rational use of aquatic resources in order to supply food needed for the world;

Realizing the limited attention which the Fisheries Division has been able to give to this responsibility;

Requests that the Director-General prepare, for consideration by the Council and the 13th Session of the Conference, proposals outlining measures which can be taken to assure that FAO, through its Fisheries Division, has in future years the status of being the leading intergovernmental body in encouraging rational harvesting of food from the oceans and inland waters, bearing in mind the dynamic relationship between the living aquatic resources and the environment and also bearing in mind the importance of fisheries in providing needed animal protein;

Also requests that means for carrying out the proposals which are to be outlined by the Director-General take into account resources not only under the Regular Program budget but also from all other possible sources;

Further requests the Council to consider the status of the Fisheries Division in order to determine how the fisheries activities could be given full recognition in the Organization and among other international bodies that concern themselves with matters related to fisheries.

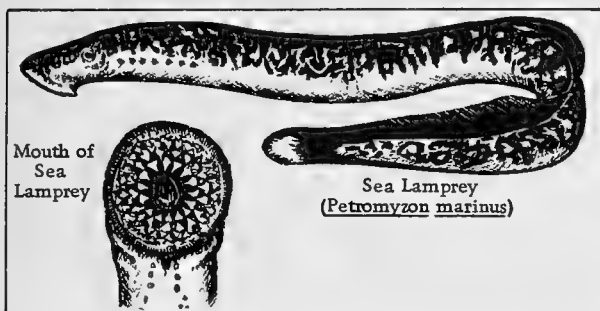
GREAT LAKES FISHERY COMMISSION

INTERIM MEETING HELD IN OTTAWA:

Continued progress in the joint Canadian-United States attack on the predatory sea lamprey in the Great Lakes was reported at an interim meeting of the Great Lakes Fishery Commission held in Ottawa, Canada, on December 6, 1963. The Commission is an international body formed eight years ago to find means of protecting and, in the case of some species, rehabilitating the commercial fish stocks of the Great Lakes.

International (Contd.):

The sea lamprey, which has played havoc with the once valuable stocks of lake trout and whitefish in many fishing areas of the lakes, is the biggest problem facing the Commission. First priority in the fight against the lamprey was given to Lake Superior, last of the Great Lakes to be invaded by the predator. The lamprey population there was reduced by 80 percent in 1962 through the use of a chemical lampricide, and was kept at about the same level in 1963.



The Commission and its advisers were welcomed by Canada's Deputy Minister of Fisheries of Canada, who said it was gratifying to note that new means of bringing the lamprey under control are being developed. He stated that the research sponsored by the Commission showed promise and had broad value but pointed out that questions regarding long-term economic control of lampreys still remained unanswered.

The meeting, under the chairmanship of Dr. A. L. Pritchard, Director of the Conservation and Development Service of the Department of Fisheries of Canada, heard progress reports from its agents, the U. S. Bureau of Commercial Fisheries and the Fisheries Research Board of Canada, as well as certain state agencies. Other members of the Commission are D. L. McKernan, vice-chairman, who is Director of the U. S. Bureau of Commercial Fisheries; Claude Ver Duin, of Grand Haven, Mich.; Lester Voight, Director of the Wisconsin Conservation Department; Dr. A. O. Blackhurst, Manager of the Ontario Council of Commercial Fisheries, Port Dover, Ont.; and Dr. J. R. Dymond, Consultant to the Ontario Department of Lands and Forests. Representatives of federal, provincial, and state agencies concerned with fisheries management in the Great Lakes and their advisers took part in the discussions.

There are 110 lamprey-producing streams tributary to Lake Superior, 98 of which have been treated with chemicals to kill the young lamprey. The chemical treatments have now been extended to Lake Michigan, and surveys recently completed on Lake Huron have located 90 lamprey-producing streams there. In Lake Michigan, 66 of the 99 lamprey-producing streams have received initial treatment. An interesting development noted at the meeting was the discovery that a molluscicide used to destroy snails in tropical countries could be used to improve the action of the lampricide. Small amounts of that chemical, added to the lampricide now being used, can almost double its effectiveness, and will reduce considerably the cost of treating the remaining Lake Michigan streams, particularly those with high flows.

In addition to reports given on the lamprey control program, the Commission heard reports on the lake trout rehabilitation program from the states of Wisconsin and Minnesota, as well as from the Bureau of Commercial Fisheries and Canada's Fisheries Research Board. In Lake Superior, the improvement in the lake trout population is most pronounced in Wisconsin, where there was a marked increase in the numbers of large fish (over 25 inches) and in the numbers of spawning trout. Hatchery fish planted in Wisconsin waters of that lake were found to have survived well. It was reported that hatchery plantings are expected to be the mainstay of the inshore fishery until natural reproduction reaches its former levels. The survival of large mature fish indicates that this will occur and that the natural population will be rehabilitated. There has also been evidence of improved survival of larger and older trout in Canadian waters in Lake Superior, and the over-all improvement appears to be continuing.

The Commission and its advisers also discussed the yellow pike (walleye) situation in Lake Erie. After several years of high production in the mid-1950's, the yellow pike population in that lake has declined drastically, although some recent recovery is in evidence for certain year classes. A program is under way to find the causes of the changes in abundance of that species and the means of improving the fishery.

At the December 6 meeting, the Commission received for study, proposed programs of investigations of the Great Lakes fisheries prepared by both Canadian and United States

International (Contd.):

fishery scientists concerned with fishing in the Great Lakes.

Note: See Commercial Fisheries Review, January 1963 p. 71.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT FISHING ENDED NOVEMBER 30, 1963:

The 1963 North Pacific halibut fishing season was marked by the failure of fishermen to fulfill catch quotas in both Area 2 and in the newly created Area 3B North Triangle.

Areas 1 and 2 in the North Pacific were closed to halibut fishing at 6 p.m. (P.S.T.), November 30, 1963, in accordance with regulations of the International Pacific Halibut Commission. At that time, the catch limit of 28 million pounds in Area 2 had not been attained; no catch limit was provided for Area 1. On October 17, 1963, the Commission announced that a total of 2.4 million pounds of halibut was still needed for attainment of the quota in Area 2. After that announcement, the halibut fleet discarded the 8-day lay-over period.

Areas 3B North and 3B South (without catch limits) were closed on October 15, 1963. Area 3B North Triangle with a catch limit of 11 million pounds was also closed on October 15, 1963. Although landings from that new area were still slightly below the quota, the total catch was 10,944,000 pounds, of which Canadian fishermen took 4,058,000 pounds, Japanese fishermen took 3,670,000 pounds, and United States fishermen took 3,216,000 pounds. Area 3A was closed on August 9, 1963, with attainment of the catch limit of 34 million pounds.

In 1963, Areas 3B North and 3B North Triangle were opened to halibut fishing on March 25, Area 3B South was opened on April 19, and Areas 1, 2, and 3A were opened on May 9.

The failure of fishermen to attain the catch limit in Area 2 resulted in an extremely long fishing season. In 1963, Area 2 was open to halibut fishing for 205 days, as compared to 122 days in 1962, 120 days in 1961, 91 days in 1960, 68 days in 1959, 59 days in 1958, 47 days in 1957, and 38 days in 1956. Halibut seasons in Area 2 were even shorter before the adoption in 1956 of the "lay-over" pro-

vision requiring fishing vessels to remain in port for a specified rest period after each trip. The fishing season in Area 2 was only 24 days in 1955, 21 days in 1954, and 24 days in 1953.

Preliminary data indicate that the United States and Canadian catch of halibut in the North Pacific in 1963 totaled 70.6 million pounds--33.8 million pounds or 48 percent of that total caught by United States fishermen and the balance of 36.8 million pounds or 52 percent of that total by Canadian fishermen. Not included in the total is almost 3.7 million pounds of halibut caught by Japanese fishermen in Area 3B North Triangle. Canadian fishermen in 1963, for the first time since the fishery has been under international control, caught over 50 percent of the total United States-Canadian landings. Since 1936 the Canadian share of the landings has been steadily increasing while the United States share has been declining.

Note: See Commercial Fisheries Review, Sept. 1963 p. 56, Aug. 1963 p. 70, and March 1963 p. 41.

NORTH PACIFIC FISHERIES COMMISSION

STATEMENT BY U. S. DELEGATION CHAIRMAN AT SEPTEMBER CONFERENCE IN TOKYO:

The second Meeting of the Parties (Canada, Japan, United States) to the International Convention for the High Seas Fisheries of the North Pacific Ocean to consider a revision of the Convention began on September 16, 1963, and came to a close on October 7, 1963. At the closing session, Benjamin A. Smith II, Chairman of the United States Delegation, made this statement:

"We have just concluded 3 weeks of intensive discussions with delegations of Canada and Japan on the future of fisheries treaty arrangements in the North Pacific. The three nations did not reach complete agreement in these talks. In view of the wide differences which remained at the end of the first round of discussions at Washington in June 1963, it would perhaps have been unrealistic to have expected complete agreement at this time.

"Nevertheless, considerable progress has been made in narrowing the differences of view. The delegations are recommending to their respective Governments that a further conference be held next spring, probably at Ottawa. I personally look forward with considerable hope to a resumption of these talks

International (Contd.):

and to the prospect of an eventual reconciliation of views among the three nations.

"As President Kennedy stated on September 10, 1963, shortly before my departure for Japan, the United States believes that the abstention principle is sound and reasonable and that without restraints of this nature the nations of the world would run serious risks of depleting fisheries. This was our position at the meeting in Tokyo. At the same time we recognized that certain difficulties had arisen with respect to the present formulation of the principle and to the language of the present treaty. For example, the Japanese people have come to interpret the treaty as an unfair arrangement imposed upon them during the period of military occupation.

"With this in mind, we submitted at the Tokyo conference a new draft treaty. This new draft involves no compromise of the principles on which we stand but does, in my view, constitute a major effort toward enabling the Japanese to accept our position.

"The United States proposal was not completely acceptable to Japan. However, Japan was willing to recognize the special interest of the United States in the salmon and halibut stocks of the eastern North Pacific and on the basis of this recognition was prepared to continue to accept substantial restrictions on its fishing in this area. This constituted a major departure from the rigid position which Japan took at the Washington talks.

"I believe that the discussions have lessened the prospects of a break in the existing relationships in the field of fisheries and that, with further patient consideration of the requirements of each country, the three nations will ultimately reach agreement." (The Department of State Bulletin, November 4, 1963.)

NORWEGIAN-SOVIET SEAL COMMISSION

SIXTH SESSION HELD IN OSLO:

The sixth session of the Norwegian-Soviet Seal Commission met in Oslo November 28-30, 1963, to consider the conservation of seal stocks in the northeastern Atlantic. The Commission, which was presided over by the leader of the Norwegian delegation, was presented with reports on the 1963 seal catch by both Norway and the Soviet Union. The Com-

mission agreed to extend scientific investigations aimed at protecting seal stocks in the northeastern Atlantic and providing for a rational exploitation of seal herds in the area. The seventh session of the Commission will be held in Moscow, either at the end of 1964 or in early 1965. (United States Embassy, Oslo, December 7, 1963.)

OCEANOGRAPHY

INTERNATIONAL INVESTIGATION OF JAPANESE "BLACK CURRENT" PLANNED:

An international working conference of oceanographers and biologists (Kuroshio Investigation Planning Meeting) met in Tokyo October 29-31, 1963. The Hawaii Area Director of the U. S. Bureau of Commercial Fisheries served as a Member of the United States Delegation, Representative of the Indo-Pacific Fisheries Council, and Rapporteur of the sessions. According to the Area Director, the meetings convened at the Japanese Ministry of Foreign Affairs, for presenting plans and background information for a long-term, multination program of research on the Kuroshio, Japan's famed "Black Current."

The idea of an international cooperative survey of the major "ocean river" of the western Pacific was put forward in a resolution of the International Oceanographic Committee in late 1962, and the Tokyo meeting, held under the auspices of United Nations Educational, Scientific, and Cultural Organization (UNESCO), the Government of Japan and several Japanese scientific organizations, was the first step in implementation of that resolution. The recommendations of the planning meeting will be reported back to the International Oceanographic Committee for its guidance in setting up detailed plans for the oceanographic investigations.

The Kuroshio is one of the main arteries in the circulation of the Pacific Ocean. It moves warm water from the Equator northward past Formosa and Japan and thence eastward across to the American coast, performing functions similar to those of the Gulf Stream in the Atlantic. It deeply affects the climates of northeastern Asia and northwestern America and helps to create, where it mingles with cold Arctic waters, some of the richest fishing grounds in the world. For these reasons its cycles of flow are of concern to many countries, a fact that was evidenced in the attendance of representatives of China, Hong Kong, Japan, Korea, the Philip-

International (Contd.):

pires, the United States, the Soviet Union, and Viet Nam at the Tokyo conference. The meeting was presided over by Japanese meteorologist Kiyoo Wadati, assisted by Claro Martin of the Philippines as vice-chairman.

The consensus of the meeting was that the Kuroshio investigations should cover an area from the Equator to 43 degrees north (roughly the latitude of Hokkaido) and from 160 degrees east longitude to the shores of Asia. Multiship research cruises would be carried out in summer and winter of 1965 and 1966. The results would then be reviewed and plans made for continuing studies of the oceanography and fisheries of the area. It is expected that Japan and the Soviet Union will assign a number of large ocean research ships to the survey. The United States is not yet committed to active participation in the study, although United States marine scientists are interested in the area and the scientific problems which it presents.



Aden

NEW FISHERIES RESEARCH VESSEL:

A new 67-foot fisheries research vessel for the Department of Fisheries, Federation of South Arabia, is under construction in Scotland and scheduled for delivery in mid-1964. The new all-steel vessel, planned for extended operations in the Indian Ocean and the Red Sea, will have a purse-seine design with accommodation and navigating space forward, leaving a large, and open deck aft. Other specifications are beam 19 feet and draft 10½ feet. A 320 horsepower Diesel engine will drive the vessel at 10 knots. It will have a refrigerated hold with a capacity of 35 metric tons.

The new vessel will have navigational and fish-finding equipment such as radar, echosounder, and radiotelephone. The electronic equipment should open up waters previously inaccessible to the Federation's two smaller vessels, the Gulf Explorer and the Federal Star. It will be possible to track and plot the movements of fish both near the surface and at depths up to 500 fathoms.

Fishing gear on the vessel will include a large purse-seine net and a special line haul-

er constructed to handle Japanese-type long-lines. The vessel will also be fitted for pole-and-line fishing for tuna with live bait.

The cost of the new vessel is being shared by Aden State and the Federation of South Arabia because it is expected to benefit both.

This is the third vessel commissioned by the Federation of South Arabia Fisheries Department in the last 16 years. The other two, both of which will remain in service, have served as both survey and training vessels. Their activities in the Indian Ocean and the Red Sea have added to knowledge of the fisheries potential in those areas, which are now attracting considerable fishing interest. (United States Consulate, Aden, December 14, 1963.)

Note: See Commercial Fisheries Review, May 1963 p. 56.



Argentina

FISH MEAL PRODUCTION ESTIMATES REVISED:

Predictions made in October 1963 as to Argentina's fish-meal production were considerably overoptimistic. Total production for 1963 is expected to be about 6,800 metric tons, rather than the 20,000 tons previously forecast. This revised estimate is based upon data from the Argentine Bureau of Fisheries for the first nine months of 1963. Production in that period amounted to 4,838 tons-- 3,947 tons from the ocean catch and 891 tons from the fresh-water catch.

The largest of Argentina's 5 major fish-meal plants began production in March 1963. The new plant is located in Mar del Plata and was originally intended for installation in Deseado in the Patagonian province of Comodoro Rivadavia. Its daily capacity is about 20 tons of fish meal, surpassing the 13-ton capacity of another plant in Mar del Plata, which began operations early in 1961. There are 3 other modern fish-meal plants processing ocean fish at Mar del Plata.

As of late 1963, the annual capacity of the industry producing fish meal from the ocean catch was about 9,600 metric tons. The capacity of the industry that processes fresh-water fish is about 2,400 tons to make an annual capacity of 12,000 metric tons. Two or three firms are seriously considering new

Argentina (Contd.):

plants for processing ocean fish, but whether these projects will be sufficiently advanced to come into production during 1964 is uncertain.

The growth of the Argentine fish-meal industry, however, is expected to continue, financed primarily by the earnings of the local fishing industry. While the uncertainty of business conditions in Argentina may have an immediate inhibiting effect on expansion, trade sources believe that the pace of development will depend primarily on the world market for fish meal, and the complementary growth of markets for Argentine fish. The 1963 landings are running 20 percent above the level of the previous year, and 1963 is certain to be a record year (estimated at 120,000-130,000 tons) for the Argentine fishing industry. (United States Embassy, Buenos Aires, November 30, 1963.)

**Brazil****SPINY LOBSTER LANDINGS AND EXPORT TRENDS:**

In 1962, exports by the steadily growing Brazilian spiny lobster industry were up 18.8 percent from 1961 and 73.1 percent from 1960, according to data supplied by the Brazilian Government. (Most of those exports are shipped to the United States in the form of frozen products.)

Brazilian spiny lobster production amounted to 3,048 metric tons in 1961, compared to 2,944 tons in 1960; 1,015 tons in 1959; and 1,100 tons in 1958.

The Superintendencia do Desenvolvimento da Pesca (SUDEPE) was recently established as a governmental coordinating agency for national fisheries development in

the form of vessels, equipment, techniques, and possibly the services of United States fishermen, although not limited to such categories. (United States Embassy, Rio de Janeiro, November 22, 1963.)

**Canada****SALMON TAGGING PROGRAM IN THE STRAIT OF GEORGIA:**

In early December 1963, biologists of the Canadian Department of Fisheries began a 6-week coho and chinook salmon tagging program in the Strait of Georgia area using the commercial purse-seine vessel *Naughty Lady*. This program represents the second phase of a field study initiated in May 1963, aimed at providing information on the factors governing the coho and chinook salmon production of the area. The tagging study is being conducted to measure, specifically, the movement and exploitation of resident coho and chinook salmon grilse within and away from the Strait of Georgia area.

Tag returns from the first phase of this project were very satisfactory largely because of the excellent cooperation of both sport and commercial fishermen. The success of the current tagging program will also be dependent on the degree of tag recovery obtained, and cooperation is again requested in returning tags to the Canadian Department of Fisheries, 1155 Robson Street West, Vancouver 5, B.C., together with the date, method, and location of recovery.

A nominal reward of 50 cents for each tag is offered. Special postage prepaid tag return envelopes are available at most boat rent-

Brazilian Exports of Spiny Lobsters, by Ports, 1958-1962

| Ports | 1962 | | 1961 | | 1960 | | 1959 | | 1958 | |
|---------------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|
| | Metric Tons | US\$ 1,000 | Metric Tons | US\$ 1,000 | Metric Tons | US\$ 1,000 | Metric Tons | US\$ 1,000 | Metric Tons | US\$ 1,000 |
| Fortaleza | 1,382 | 2,708 | 1,266 | 2,070 | 711 | 1,041 | 390 | 430 | 239 | 264 |
| Recife | 688 | 1,331 | 475 | 793 | 485 | 775 | 226 | 252 | 191 | 209 |
| Santos | - | - | - | - | - | - | - | - | 3 | 3 |
| Total | 2,070 | 4,039 | 1,741 | 2,863 | 1,196 | 1,816 | 616 | 682 | 433 | 476 |

Brazil. The Chief of the Technical Staff of SUDEPE has stated that there are good opportunities for United States investment in the Brazilian spiny lobster industry; however, he stressed that such investment would have to collaborate with Brazilian capital. United States investment, he suggested, might be particularly attractive in

al and boat moorage facilities and fish camps in the area. Tags may also be returned to any Fishery Officer. (Canadian Department of Fisheries, Vancouver, November 29, 1963.)



Congo Republic

FRESHWATER FISHERIES PRODUCTION DROPS SHARPLY:

In 1959, the Kivu area of the Congo Republic produced about 37,000 tons of fish from Lakes Tanganyika, Kivu, and Edward, including fish caught by traditional as well as by modern methods. Since that time, the catch has been reduced to a small fraction of the 1959 total, and retail prices have risen to a point where only the most well-to-do citizens can afford to eat fish. Causes of this drop in production are the lack of nets, vessels, and organization. For the modern section of the industry, technicians and nets are needed, as well as some way of getting the vessels and the refrigeration plant back into operation. Solution of those problems could result in a catch of 40,000 tons a year, which would be of considerable value to the Kivu area economy. In addition, the area could not only supply a part of the fish needs of the rest of the Congo, but could also export fish. (United States Consulate, Bukavu, November 6, 1963.)



German Federal Republic

NEW RESEARCH VESSEL "METEOR II":

The new research vessel Meteor II was launched in Germany during August 1963 under the joint ownership of the German Hydrographic Institute of Hamburg and the German Research Association of Bad Godesbert.

The Meteor II is a 265-foot, Diesel-electric vessel displacing 2,200 tons. Its main engine gives a speed of 14 knots on a single screw, but it also has both an active rudder and a bow propulsion unit, giving extreme maneuverability. Active antirolling tanks were also fitted. The vessel will carry a total complement of 57, including 24 persons in the scientific party. (National Oceanographic Data Center, Newsletter, October 31, 1963.)



Ghana

FISHERIES TRENDS, THIRD QUARTER 1963:

Programs by Ghana to expand the production of fish, principally by the purchase of large modern fishing craft, received particular attention during the third quarter of 1963. The Government signed an agreement on July 9 with a Norwegian shipbuilding group for the delivery of six fishing trawlers. A £G5.7 million (US\$15,960,000) contract was also signed with a large Japanese shipbuilding company for the construction of 10 stern trawlers and 2 carriers. All of the vessels are to be used by the Government-owned fishing corporation and deliveries are scheduled to start in mid-1964.

The Government fishing corporation took delivery in early August 1963 of two British-built stern trawler fishing vessels. Those vessels were the first to be delivered to the corporation, which left a total of 36 fishing vessels still on order--18 stern trawlers (6 from Norway, 10 from Japan plus 2 carriers), 8 side trawlers (Soviet Union), and 10 purse seiners (Soviet Union).

A private Ghanaian fishing company has on order 4 fishing trawlers from Japan and Yugoslavia. The 2 Japanese trawlers were to cost £G180,000 (\$504,000) each; the 2 smaller Yugoslavian vessels £G42,000 (\$117,600).

The Ministry of Agriculture has announced plans to increase the production of fish through the development of fisheries in the Volta River and its tributaries. Particular emphasis was to be placed on the development opportunities which would be provided by the creation of the 3,200-square mile Volta Lake after completion of the Akosombo Dam. (United States Embassy, Accra, December 1, 1963.)

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FISHERY IMPORTS PLACED UNDER THE CONTROL OF STATE CORPORATIONS:

The Ghanaian Minister of Trade announced on November 28, 1963, that, effective immediately, all imports of fresh and frozen fish would be handled by the Government-owned Ghana Fishing Corporation. All licenses issued to private firms for the importation of fish and for the charter of foreign fishing vessels were withdrawn. Affected firms, however, were permitted to continue to operate their own vessels. The Minister indicated

Ghana (Contd.):

that the new regulations were designed to permit the Ghana Fishing Corporation to exercise complete control over the supply and price of fresh and frozen fish.

The announcement followed a similar declaration on November 13, 1963, that, effective January 1, 1964, the Government-owned Ghana National Trading Corporation would be the sole importer of a number of essential commodities including canned fish. (United States Embassy, Accra, December 1, 1963.)



Greece

FISHERIES TRENDS,
JANUARY-SEPTEMBER 1963:

Greek freezer and refrigerated trawlers operating in the Atlantic delivered 14,352 metric tons of frozen fish during January-September 1963, compared with landings of 11,888 tons during the same period of 1962 and 10,131 tons in the first 9 months of 1961. Contributing to the increased production in January-September 1963 was the expansion of the fleet of large freezer trawlers to 19 vessels; 2 more freezer trawlers were to be added in late 1963 and 6 were scheduled for delivery in 1964. The new vessels could raise the annual productive capacity of the Greek Atlantic fleet to 30,000 tons of frozen fish in 1964. Because of the increased catch, Greek operators are seeking a curtailment of fishery imports:

Greece sponge fishing in Greek, Egyptian, and Libyan waters through 1963 was expected to yield about 20 percent more than the 1962 production of 71 tons. Some Greek divers switched to aqualung devices in 1963 following the Greek Government's approval of SCUBA diving equipment.

Favorable conditions exist for the development of a Greek pearl culture industry, according to a Japanese report issued in October 1963. (Alieia, October 1963, and United States Embassy, Athens, November 22, 1963.)

Note: See Commercial Fisheries Review, December 1963 p. 63.



Iceland

ICELANDIC FISHERY LANDINGS BY
PRINCIPAL SPECIES, JANUARY-JULY 1963:

| Species | January-July | |
|-------------------------|---------------------------|---------|
| | 1963 | 1962 |
| | (Metric Tons) | |
| Cod | 203,157 | 196,595 |
| Haddock | 30,007 | 23,762 |
| Saithe | 8,270 | 8,305 |
| Ling | 4,149 | 5,491 |
| Wolfish (catfish) | 11,921 | 12,035 |
| Cusk | 4,826 | 4,052 |
| Ocean perch | 19,648 | 3,636 |
| Halibut | 695 | 892 |
| Herring | 196,026 | 244,231 |
| Shrimp | 349 | 349 |
| Capelin | 1,077 | - |
| Other | 7,537 | 6,865 |
| Total | 487,662 | 506,213 |

Note: Converted to whole ungutted fish regardless of how landed.

* * * * *

ICELAND'S UTILIZATION OF FISHERY
LANDINGS, JANUARY-JULY 1963:

| How Utilized | January-July | |
|----------------------------------|---------------------------|---------|
| | 1963 | 1962 |
| | (Metric Tons) | |
| Herring ^{1/} for: | | |
| Oil and meal | 126,696 | 183,516 |
| Freezing | 20,605 | 16,104 |
| Salting | 43,982 | 36,603 |
| Fresh on ice | 5,617 | 7,718 |
| Groundfish ^{2/} for: | | |
| Fresh on ice | 19,139 | 16,331 |
| Freezing and filleting | 125,304 | 113,844 |
| Salting | 65,793 | 81,492 |
| Stockfish (dried unsalted) | 65,971 | 38,830 |
| Canning | 237 | 289 |
| Home consumption | 8,610 | 7,726 |
| Oil and meal | 2,290 | 1,722 |
| Shellfish for: | | |
| Fresh on ice | 2 | - |
| Freezing | 3,334 | 1,952 |
| Canning | 82 | 86 |
| Total production | 487,662 | 506,213 |

^{1/}Whole fish.

^{2/}Drawn fish.

Source: Statistical Bulletin, vol. 32, no. 4, November 1963, The Statistical Bureau of Iceland, Reykjavik, Iceland.

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EXPORTS OF FISHERY PRODUCTS,
JANUARY-SEPTEMBER 1963:

During January-September 1963, there was a considerable increase in exports of frozen herring, herring meal, and cod-liver oil as compared with the same period in 1962, according to the Statistical Bureau of Iceland's Statistical Bulletin, November 1963. Exports of fish meal and uncured salted fish showed a considerable decrease in the first 9 months of 1963 (see table).

Iceland (Contd.):

| Icelandic Fishery Exports, January-September 1963 with Comparisons | | | | | | |
|--|-----------------|--------------|---------------|-----------------|--------------|---------------|
| Product | Jan.-Sept. 1963 | | | Jan.-Sept. 1962 | | |
| | Qty. | Value f.o.b. | | Qty. | Value f.o.b. | |
| | Metric Tons | 1,000 kr. | US\$ 1,000 | Metric Tons | 1,000 kr. | US\$ 1,000 |
| Salted fish, dried | 1,579 | 32,065 | 744 | 1,938 | 38,111 | 884 |
| Salted fish, uncured | 17,569 | 221,266 | 5,133 | 23,892 | 287,720 | 6,675 |
| Salted fish fillets | 969 | 12,291 | 285 | 1,090 | 14,878 | 345 |
| Wings, salted | 1,504 | 18,484 | 429 | 983 | 11,271 | 261 |
| Stockfish | 5,202 | 146,323 | 3,395 | 6,550 | 167,751 | 3,892 |
| Herring on ice | 7,224 | 23,417 | 543 | 4,899 | 17,144 | 398 |
| Other fish on ice | 22,960 | 121,199 | 2,812 | 17,045 | 84,915 | 1,970 |
| Herring, frozen | 26,159 | 144,498 | 3,352 | 17,076 | 93,552 | 2,170 |
| Other frozen fish, whole | 2,265 | 24,133 | 560 | 1,134 | 15,344 | 356 |
| Frozen fish fillets | 41,535 | 767,720 | 17,811 | 40,322 | 703,639 | 16,324 |
| Shrimp and lobster, frozen | 438 | 44,495 | 1,032 | 328 | 32,591 | 756 |
| Roes, frozen | 788 | 13,227 | 307 | 648 | 12,401 | 288 |
| Canned fish | 174 | 9,036 | 210 | 222 | 11,235 | 261 |
| Cod-liver oil | 7,175 | 52,337 | 1,212 | 3,751 | 30,459 | 707 |
| Lumpfish roes, salted | 324 | 5,322 | 123 | 401 | 6,156 | 143 |
| Other roes for food, salted | 3,176 | 44,919 | 1,042 | 2,745 | 37,922 | 880 |
| Roes for bait, salted | 1,745 | 12,571 | 292 | 1,387 | 8,678 | 201 |
| Herring, salted | 29,098 | 295,780 | 6,862 | 26,685 | 256,601 | 5,953 |
| Herring oil | 29,981 | 139,055 | 3,226 | 33,294 | 141,245 | 3,277 |
| Ocean perch oil | 754 | 5,130 | 119 | 15 | 59 | 1 |
| Whale oil | 3,298 | 23,093 | 536 | 1,152 | 9,104 | 211 |
| Fish meal | 11,535 | 64,317 | 1,492 | 19,334 | 121,130 | 2,810 |
| Herring meal | 44,608 | 266,186 | 6,176 | 37,230 | 243,555 | 5,650 |
| Ocean perch meal | 2,953 | 13,754 | 319 | 34 | 204 | 5 |
| Wastes of fish, frozen | 4,452 | 12,426 | 288 | 4,544 | 11,457 | 266 |
| Liver meal | 371 | 2,563 | 59 | 305 | 2,029 | 47 |
| Lobster and shrimp meal | 72 | 193 | 4 | 13 | 42 | 1 |
| Whale meal | 100 | 558 | 13 | 402 | 2,151 | 50 |
| Whale meat, frozen | 1,967 | 13,564 | 315 | 1,621 | 12,284 | 285 |

Note: Values converted at rate of 1 krona equals 2.32 U. S. cents.



Ireland

NEW FISHING COMPANY AIDED BY JAPANESE AND FRENCH INTERESTS:

Irish, Japanese, and French interests have combined to form a new offshore fishing company. The company will be based in Ireland, but fish will be landed for export only. The major shareholder in the new company, which was registered in Dublin early in December 1963, is a large Japanese fishing company. The French interest comes from the important fishing center of Lorient in Brittany.

It is expected that the new company will operate 6 deep-sea vessels, built to the most modern design, and each costing about £750,000 (US\$2.1 million).

It is possible that three of the vessels may be built at a shipyard in Cork. Each vessel would employ about 100 men.

The vessels will fish in the North Atlantic and none of the catch will be marketed in Ireland. The bulk of the catch is expected to be packaged on board and delivered directly to British and other European markets. The balance will be landed at an Irish port and processed for export. The new company expects a gross return of about £3 million (\$8.4 million) a year from its operations.

Ireland (Contd.):

No definite decision has yet been made on the choice of a base port but Galway, where harbor facilities are good and a fish-processing factory is close at hand, might be a likely choice. (Irish Press, December 12, 1963.)



Italy

1963 QUOTA FOR FRESH AND FROZEN TUNA IMPORTS INCREASED:

The Italian Government on October 31, 1963 (Gazzetta Ufficiale No. 316, December 5, 1963), increased the import quota for fresh and frozen tuna by 8,000 metric tons for the last two months of 1963. The quota, which is duty-free, was opened to all countries. (United States Embassy, Rome, December 14, 1963.)



Japan

VALUE OF FROZEN AND CANNED TUNA EXPORTS, JANUARY-SEPTEMBER 1963:

Japan's exports of frozen tuna to the United States in the first 9 months of 1963 were down 45.7 percent in value as compared with the same period in 1962. For the same period the export value of canned tuna increased 1.0 percent.

| Product | Jan.-Sept. 1963 | | | Jan.-Sept. 1962 | | |
|------------------|-----------------|--------|-------------|-----------------|--------|------------|
| | U.S. | Total | U. S. Ratio | U.S. | Total | U.S. Ratio |
| | (In US\$1,000) | | % | (In US\$1,000) | | % |
| Tuna, frozen . . | 13,900 | 33,384 | 41.6 | 25,603 | 40,500 | 63.2 |
| Tuna, canned . . | 10,763 | 16,702 | 64.4 | 10,652 | 15,341 | 69.4 |

Note: Exports are valued f.o.b. Japan.
Source: Customs Bureau, Japanese Ministry of Finance.

The United States took 41.6 percent of Japan's total frozen tuna exports during the first nine months of 1963 as compared with 63.2 percent in the same period of 1962. The United States ratio of Japan's total canned tuna exports was 64.4 percent as against the same period in 1962 when it was 69.4 percent. (United States Embassy, Tokyo, November 1963.)

* * * * *

CANNED TUNA SALE TO THE UNITED STATES:

The Tuna Standing Committee of the Japan Canned Foods Exporters Association decided that the first canned tuna sale to the

United States in the business year which began December 1, 1963, should consist of 100,000 cases. Since this quantity is exactly half that which the Canned Tuna Packers Association approved for release for the first sale, the two organizations expected to meet to resolve their differences. (Suisan Keizai Shimbun, December 15, 1963.)

* * * * *

NEW TYPE CANNED TUNA PRODUCT DEVELOPED:

A new canned tuna product--"tuna steak"--has been developed by a Japanese fishing company. Seasoned with soy sauce and cooked in vegetable oil, the product is said to be very tender and meaty in taste, unlike the usual tuna pack in which some fish odor is generally present. The "tuna steak," which is packed in 160-gram (5.6-oz.) cans, was placed on sale on the Japanese domestic market on December 1, 1963, and retailed at 60 yen (17 U. S. cents) per can.

The Japanese firm is reported to be experimenting with other cooking and seasoning methods for the manufacture of specialty packs suitable for export to foreign countries. (Suisan Tsushin, December 2, 1963.)

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FROZEN TUNA EXPORT MARKET IN EARLY DECEMBER 1963:

The Japanese frozen tuna export market, which had been described as favorable early in December 1963, had turned sluggish due to few tuna vessel arrivals in Japan and resultant high ex-vessel prices. The market quotation for frozen gilled-and-gutted yellowfin for export to the United States from Japan proper was US\$375 a short ton c.&f. However, the ex-vessel price of yellowfin when converted to the c.&f. export price reportedly is equal to US\$390 a short ton. This situation has resulted in very few export contracts being concluded with United States tuna buyers, according to reports.

On the other hand, the European frozen tuna import market is reported to be firm. Japanese frozen gilled-and-gutted yellowfin exported to Italy were reported to have brought US\$400-410 a metric ton c.&f. Frozen gilled-and-gutted big-eyed tuna were said to be selling for US\$325-330 a metric ton c.&f., and mixed shipments of big-eyed

Japan (Contd.):

and yellowfin tuna (with a preponderance of big-eyed) sold for \$340 a metric ton.

Reportedly, yellowfin tuna made up about 30 percent of the total catch of tuna in the Atlantic Ocean for the first 11 months of 1963. (Suisancho Nippo, December 7, 1963.)

* * * * *

ALBACORE TUNA EX-VESSEL PRICE TRENDS, NOVEMBER-DECEMBER 1963:

The Japanese ex-vessel price for albacore tuna increased sharply in the latter part of 1963. In late November, the ex-vessel price of albacore at Kesennuma ranged between 90-120 yen a kilogram (US\$227-302 a short ton), with a high of 136 yen a kilogram (\$343 per short ton) reported on November 30. On December 6, the ex-vessel price of albacore at Kesennuma was reported as 115-159 yen a kilogram (\$290-401 per short ton), and at Shimizu 165-185 yen a kilogram (\$416-467 per short ton). However, on the same day, about 16 short tons of frozen albacore landed at Yaizu sold at ex-vessel prices of 70-130 yen a kilogram (\$176-328 per short ton). A day earlier, on December 5, the ex-vessel price of frozen albacore at Yaizu ranged from 100-165 yen a kilogram (\$252-416 a short ton).

During the following week (December 14), 1,650 pieces of albacore landed at Kesennuma brought from 120-160 yen a kilogram (\$302-403 a short ton); and at Miyako, an undetermined quantity of albacore landed on the same day sold for 146-158 yen a kilogram (\$368-398 a short ton). On December 10 at Shimizu, 390 pieces of albacore brought ex-vessel prices of 110-160 yen a kilogram (\$277-403 a short ton). (Suisan Keizai Shim-bun, December 6, 7, 11, and 15, 1963, and other periodicals.)

* * * * *

FROZEN TUNA EXPORT MARKET TRENDS, MID-DECEMBER 1963:

The Japanese export frozen tuna market as a whole was considered dull in mid-December 1963, with few export agreements concluded with United States tuna buyers. However, one large United States packer was reported seeking frozen gilled-and-gutted yellowfin tuna in Japan and offering US\$10 a short ton above the existing Japanese f.o.b.

export price of \$325 a short ton. The same firm was also said to be offering nearly \$30 a short ton above the prevailing export market price for tuna loins. Reportedly, the United States firm planned to ship tuna purchased in Japan to its Puerto Rico plant on a chartered freighter in late December. (Suisan Tsushin, December 16, 1963, and other sources.)

* * * * *

NEW FROZEN TUNA EXPORT REGULATIONS PLANNED:

The Japan Export Frozen Tuna Producers Association met December 12, 1963, and appointed chairmen of those committees which are expected to meet early in 1964 to begin drafting tuna export regulations for fiscal year 1964 (April 1964-March 1965). The committees involved are the Direct Export Committee, the Atlantic Ocean and Indian Ocean Committees, and the Tuna Loin Committee.

The chairman of the Producers Association has been delegated the responsibility of appointing a committee to study the problem involving the landing of frozen tuna at overseas tuna bases, such as American Samoa. Under current regulations, Japanese vessel owners operating vessels out of certain overseas tuna bases can only operate "ice" boats and must land their catches in fresh form. (Suisan Tsushin, December 14, 1963.)

* * * * *

DENMARK CONTRACTS TO IMPORT FROZEN TUNA:

Denmark is reported to have contracted to purchase 250 metric tons of Atlantic Ocean-caught frozen tuna (160 tons of bluefin and 90 tons of big-eyed) from Japan. The sale, negotiated by a Japanese trading company, reportedly was contracted at export prices of US\$425 per metric ton for gilled-and-gutted bluefin and \$365 per metric ton for gilled-and-gutted big-eyed, both prices c.i.f. Esbjerg and Skagen, Denmark. Shipment was expected to be made by the end of 1963.

This is believed to be the first time that Japanese frozen tuna have been exported to Denmark, which normally purchases bluefin tuna from Norway. Norway had a poor bluefin season in 1963 and was unable to supply Denmark's demand, hence the special pur-

Japan (Contd.):

chase from Japan. (Suisan Tsushin, December 7, 1963.)

* * * * *

TUNA FISHING TRENDS IN EQUATORIAL PACIFIC, NOVEMBER 1963:

An examination of catch statistics as of November 30, 1963, reveals that Japanese tuna vessels fishing the vast equatorial waters of the Pacific Ocean (from the vicinity of Samoa to the waters off the Philippine Islands and off Borneo) averaged about one metric ton of tuna per day per trip. Very few vessels caught over two tons per day. Due to extremely poor fishing during the first 11 months of 1963 in the equatorial Pacific Ocean, many vessels in December 1963 reportedly moved to the fishing grounds south-east of Australia, where they were catching an average of 1.5 metric tons a day, as compared to an average of 3-4 tons a day in 1962. Also, many Japanese tuna vessels were reported to have moved to the tuna grounds in the eastern South Pacific. Those vessels were said to be averaging 2.5-3 tons per day. (Suisancho Nippo, December 9, 1963.)

* * * * *

TUNA TRANSHIPMENT OPERATIONS AT DURBAN, SOUTH AFRICA:

A large Japanese fishing company has established a 5,000-ton transshipment target in 1964 for its base in Durban, South Africa. To meet the target, the firm is actively encouraging Japanese tuna vessel owners, operating vessels in the Indian Ocean, to deliver their catches in 1964 to Durban. At least 7 tuna vessels delivered their catches to Durban in late 1963. The Japanese firm's 1963 operation at Durban (started in June 1963) was reported to be less than successful.

For the period June-November 1963, transshipments^{1/} of frozen tuna to Japan proper from Durban totaled: 739 metric tons of round albacore; 373 tons of gilled-and-gutted yellowfin; 74 tons of yellowfin fillets; 10 tons of round big-eyed; 138 tons of big-eyed fillets; 116 tons of dressed spearfish; 60 tons of spearfish fillets; and 75 tons of shark. (Suisancho Nippo, December 13, 1963.)

^{1/}Transshipments to the United States not permitted.

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NEW LONG-LINE GEAR TESTED OFF WEST AFRICAN COAST:

A Japanese fishing company has dispatched the 350-ton tuna-fishing vessel Koyo Maru to the Atlantic Ocean to explore the waters off Angola, Congo, and South-West Africa. Reportedly, the vessel will test a new type of gear described as "vertical long-line" designed to fish tuna and other fish of that type at different depths simultaneously. (Suisan Tsushin, December 11, 1963.)

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FISHING VESSEL CONSTRUCTION PERMITS, LATE 1963:

On December 7, 1963, the Japanese Fisheries Agency issued permits for the construction of 84 fishing vessels, including 47 tuna vessels. Of the tuna vessels, 42 were vessels of the 39-ton class. In November 1963, the Agency authorized the construction of 140 39-ton vessels. (Suisan Keizai Shimbun, December 15, 1963, and other sources.)

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FISHING VESSEL CONSTRUCTION PERMITS, NOVEMBER 1963:

During the month of November 1963, the Japanese Fisheries Agency issued permits for the construction of 240 fishing vessels. Of these, 140 were permits for the construction of 39-ton tuna vessels, for which fishing licenses were not required in 1963 but will be required in 1964. In addition, the Agency issued permits for the construction of 18 tuna vessels ranging in size between 70-300 tons gross (mostly over 200 tons), two 19-ton portable tuna-fishing boats, and two 3,430-ton distant-water trawlers. The trawlers are expected to be assigned for operation in the Bering Sea. (Suisan Keizai Shimbun, November 7, 17, & 29, 1963; and other sources.)

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GOVERNMENT STOPS APPLICATIONS FOR PERMITS TO CONSTRUCT SMALL TUNA VESSELS:

Effective December 7, 1963, the Japanese Fisheries Agency stopped accepting applications for permits to construct 39-ton tuna fishing vessels by publishing in the Government Gazette the ministerial ordinance relating to the establishment and requirements of the newly designated "coastal (offshore) tuna fishery" (north of 10° N. lat. and west of 160° E. long.). Under this ordinance, tuna vessels in

Japan (Contd.):

the 20- to 39-ton size classification, which heretofore operated freely without fishing licenses, will henceforth be brought under a licensing system. At the same time, the operation of tuna vessels in the 20- to 50-ton size category will be restricted to the "off-shore tuna fishery."

The Fisheries Agency had been flooded in October and November 1963 with applications for permits to construct 39-ton tuna vessels when it became apparent that the Government intended to regulate the operation of this class of vessels. Reportedly, to control the flow of applications for licenses to operate tuna vessels in the newly designated fishery, including application for permits to construct new 39-ton vessels, the Agency published the ministerial ordinance somewhat earlier than generally anticipated.

The number of tuna vessels in the 20- to 50-ton size classification to be licensed for operation in the newly established "offshore tuna fishery" was scheduled for governmental decision in January 1964. Reportedly, the Agency intends to restrict the number of operational vessels to about 1,200 vessels, although it is estimated that the Agency, as of December 7, was in receipt of over 2,000 applications to operate tuna vessels in the "offshore tuna fishery." (Suisan Tsushin, December 9, 1963.)

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LICENSES APPROVED FOR DISTANT-WATER TRAWLERS:

The Japanese Fisheries Agency on November 28, 1963, met with the Central Fisheries Coordination Council (highest government-industry advisory group on fisheries) to review applications for distant-water trawl licenses filed before the October 18 deadline by Japanese fishing companies. At that meeting, the Fisheries Agency approved the Council's recommendation that the government license a total of 18 vessels for distant-water trawl operation and also adopted the Council's proposed licensing requirements for those vessels.

Licensing requirements and number of trawlers approved for distant-water operation are:

(1) The two Japanese fishing companies currently operating over 10 trawlers in the Atlantic Ocean shall not be granted licenses to operate additional trawlers in that ocean.

(2) Regardless of the number of applications submitted by the fishing companies, not more than one trawler license shall be issued to any company for each area of operation.

The 13 vessels newly licensed for operation in the Atlantic Ocean (off Africa) are 6 vessels of 299 gross tons; 1 vessel of 500 tons; 1 vessel of 1,500 tons; 1 vessel of 2,000 tons; 1 vessel of 2,500 tons; 1 vessel of 2,800 tons; 1 vessel of 3,000 tons; and 1 vessel of 3,500 tons. The 5 vessels licensed to operate in the Southwest Pacific (off Australia and New Zealand) are as follows: 1 vessel of 299 tons; 1 vessel of 990 tons; 2 vessels of 1,850 tons; and 1 vessel of 2,000 tons. (Nihon Keizai Shimbun, November 29, 1963; Suisan Tsushin, November 28, 1963.)

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ATLANTIC TRAWL FISHERY TRENDS, NOVEMBER-DECEMBER 1963:

The Japanese trawler Aoi Maru No. 2, (1,104 gross tons), which had been operating in the North Atlantic Ocean off Newfoundland for approximately a year, arrived at the Japanese port of Nagoya on November 24, 1963. The trawler was scheduled to depart for the North Atlantic fishing grounds again in late January 1964. (Suisan Tsushin, November 27, 1963.)

The Japanese Fisheries Agency authorized Japan's two largest fishing companies to conduct experimental trawl fishing in the Atlantic Ocean off Argentina for a period of one year, beginning December 1, 1963. One of the companies plans to use the 1,800-ton trawler Taiyo Maru No. 66. The other company will work from the 1,100-ton trawler Ikoma Maru. The Fisheries Agency has defined the experimental trawling area as the waters south of latitude 25° S. and west of longitude 40° W. (Suisan Keizai Shimbun, December 11, 1963.)

The Fisheries Agency is reported to have under study a plan to permit distant-water trawlers, operating out of overseas bases such as those in the Atlantic Ocean, to transfer their catches at sea. The plan, if ap-

Japan (Contd.):

proved, is expected to assist materially the operating efficiency of trawlers under 1,000 gross tons. (Suisan Keizai Shimbun, December 11, 1963.)

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**SAURY FISHERY PRODUCTION
AND EXPORT TRENDS
LATE NOVEMBER 1963:**

The Japan Saury Sales Company was reported early in December 1963 to have contracted to sell a total of 90,000 cases of canned saury (80,000 cases of No. 1 small and 10,000 cases of No. 4) to Egypt. The sale was concluded at export prices of US\$6.54 per case for No. 1 small and \$6.53 per case for No. 4, f.o.b. Japan, with shipment to be made pending issuance of an import license by the Egyptian Government. The import license was expected to be issued by the end of 1963.

Saury fishing in Japan, which was very poor as of early November, picked up sharply after mid-November with 4,000-5,000 metric tons per day being landed. The increased landings resulted in a sharp drop in the ex-vessel price, from the US\$103 a ton reported in early November to about \$50 a ton in late November. To stabilize landings and prices, the National Saury Production Adjustment Association began to curtail fishing operations by closing the fishery for 48-hour periods every 5-7 days, depending on fishing conditions. On December 5, the ex-vessel prices of saury at the fishing ports of Kesenuma, Onagawa, and Ishinomaki had recovered somewhat and were quoted at \$71-78 a ton. (Suisan Tsushin, December 2, 7, & 9; Nihon Suisan Shimbun, November 27, 1963; and other sources.)

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**PLANS CALL FOR DOUBLING
SALMON HATCHERY FACILITIES:**

In 1962, Japan's Fishery Agency began a three-year program to double the number of artificially hatched salmon to 1,000 million fish a year. However, a curtailment of funds reduced the capital from US\$1,667,000 a year to \$750,000 a year. Due to this development, the privately supported Japan Fisheries Association, contributor of one-third of the funds for the Government program (initial plan \$556,000 a year, now \$250,000), is plan-

ning to initiate its own program to supplement the present plan. To this end the Fisheries Association will establish a new salmon hatchery in Eastern Hokkaido costing about \$278,000 over a two-year period.

It is evident that the Japanese authorities are putting considerable effort into the improvement of their facilities. One of the best stations is at Abashiri on the Sea of Okhotsk where modern facilities are producing about 20 million small salmon a year. That station is particularly effective because the salmon are released into a lake for further growth before leaving for the sea.

One problem, however, that remains outstanding in Hokkaido is the effect on naturally spawned salmon of industrial waste and agricultural chemicals which are increasingly polluting the rivers. (United States Embassy, Tokyo, December 3, 1963.)

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**UNMANNED OCEANOGRAPHIC STATIONS
TO BE SET UP OFF COAST:**

The Japanese Fisheries Agency has announced a three-year plan to establish 42 unmanned oceanographic observation towers off various coastal areas of Japan beginning in FY 1964 (April 1964-March 1965) as part of a long-range program to forecast oceanographic and fishing conditions. The unmanned towers will continuously record oceanographic conditions in coastal waters where severe changes in sea conditions are believed to exert considerable influences on the coastal fisheries. Initially 10 of these towers will be installed off nine prefectures during FY 1964. (Suisan Keizai Shimbun, November 27, 1963.)



Malaysia

**MARKET TRENDS FOR
IMPORTED CANNED SARDINES:**

A recent survey of Malaysian markets shows that sales of United States canned sardines are as popular as other brands in the higher income groups and that there is no particular preference as to type of can or pack. In the lower income groups, canned sardines from Japan (which are lower-priced and of acceptable quality) are reported to be most popular. United States sardines packed in to-

Malaysia (Contd.):

| Type and Price of Canned Sardines by Country of Origin | | | |
|--|-------------------|-------|-------------------|
| Size, Type of Can and Pack | c.i.f. Price/Case | | Country of Origin |
| | M\$ | US\$ | |
| 100/3 $\frac{3}{4}$ - to 4-oz. without key (dingley): | | | |
| Soybean oil | 28.00 | 9.15 | Canada |
| Tomato sauce | 28.00 | 9.15 | " |
| Olive oil | 75.00 | 24.50 | " |
| 100/3 $\frac{3}{4}$ - to 4-oz. (flats) | 28.00 | 9.15 | Canada |
| 48 or 24/15-oz. (oval cans): | | | |
| Tomato sauce | 34.00 | 11.11 | Japan |
| Natural or brine | 39.00 | 12.75 | " |
| 48 or 24/8-oz. (oval cans): | | | |
| Tomato sauce | 18.00 | 5.88 | Japan |
| Soybean oil | 18.00 | 5.88 | " |
| Natural or brine | 19.00 | 6.21 | " |
| 48 or 24/15-oz. (tall cans): | | | |
| Tomato sauce | 42.00 | 13.73 | U. S. (Calif.) |
| Natural or brine | 42.00 | 13.73 | " |
| 100/5-oz. (tall cans): | | | |
| Tomato sauce | 32.00 | 10.46 | U. S. (Calif.) |
| Natural or brine | 32.00 | 10.46 | " |

mato sauce in 5-ounce tall cans are also popular with the lower income groups. Many stores reported that they have discontinued selling canned herring and pilchard, especially United States brands, because of a lower demand, due mainly to price and lack of supplies. Canned salmon and horse mackerel from the United States are not much in demand, although in the lower income groups there is a market for Japanese horse mackerel packed in tomato sauce. With the exception of the higher income groups, the lower income groups prefer canned fish packed in tomato sauce.

The information in the table on canned sardines marketed in Malaysia was obtained from the survey. (United States Embassy, Kuala Lumpur, December 20, 1963.)

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FISHERIES TRENDS, THIRD QUARTER 1963:

A temporary ban on trawling in Malaysian waters was imposed by the Government in July 1963. Trawling permits had been sought by many prospective enterprises, including a number backed by joint Japanese-Malaysian interests. The lifting of the trawling ban depends on the completion of plans being drawn by the Ministry of Agriculture and Cooperatives to ease the hardships that trawl fishing will cause fishermen using more primitive methods.

In September 1963, prospects for improved east coast fishery marketing facilities were brightened by a M\$1.5 (US\$490,000) million Canadian contribution through the Colombo Plan. The money will provide cold-storage facilities at several locations. The first freezing plant will be installed at the port of Kuantan in 1964 and used by the Government to popularize local frozen fish. (United States Embassy, Kuala Lumpur, November 26, 1963.)



Morocco

CANNED FISH EXPORTS, JUNE-SEPTEMBER 1962-63:

Exports of canned fish by Morocco during June-September 1963 were substantially higher than for the same period in 1962, but lower than in 1961. Total canned fish exports amounted to 963,942 cases during June-September 1963 as compared with 897,382 cases in 1962, and 1,053,531 cases in 1961. Exports of sardines during the 4-month period of 1963 totaled 728,542 cases as compared with 733,574 cases in 1962 and 828,393 cases in 1961. Canned tuna exports amounted to 36,737 cases during June-September 1963 as compared with 60,125 cases in 1962. Exports of other fish rose to 198,663 cases from 103,684 cases in 1962. (United States Embassy, Rabat, November 28, 1963.)



Netherlands

VIEWS ON NORTHEAST ATLANTIC AND EUROPEAN FISHERY POLICIES:

The Netherlands Minister of Agriculture and Fisheries has announced that the Northeast Atlantic Fisheries Commission, set up under the 1959 Northeast Atlantic Fisheries Convention, will hold its first meeting in The Hague, May 11-17, 1964, at the invitation of his Government. The meeting should show whether participants are willing to implement the Convention's provisions which are designed to prevent overfishing in the northeastern section of the Atlantic Ocean. As far as the Netherlands is concerned, measures going beyond those laid down in the previous Convention are acceptable only if made subject to international inspection.

Netherlands (Contd.):

The Minister welcomed a British initiative in inviting European Economic Community (EEC) and European Free Trade Association (EFTA) countries as well as Ireland, Iceland, and Spain to an international conference in London on December 3, 1963, to discuss the problem of unilateral extension of national fishing limits. In addition other problems were aired including access to fishing areas, trade in fish, fisheries policy, and police supervision.

The Government is also in favor of a common EEC fisheries policy which would rule out any national measures detrimental to Community partners and preferably make territorial waters of EEC countries accessible without restriction to all fishermen of all present or future members. (United States Embassy, The Hague, December 10, 1963.)

* * * * *

OYSTER INDUSTRY DECLINES:

In the 1961/1962 season, a total of 30 million oysters was harvested in the Netherlands, but a few more years may see the end of this century-old oyster culture which is concentrated around the port of Yerseke in Zeeland, that province of islands in southwest Holland. The Oosterschelde estuary (which is the cradle of the Dutch oyster industry) will be cut off from the sea by the construction of the Delta flood-prevention dyke. That famous oyster area will become a lake unfit for oyster culture when the Delta project is completed in about 10 years.

The intense winter cold of the 1962/1963 season created a crisis in the industry. Out of 150 million oysters, only 0.05 percent survived, and those few were not capable of continuing propagation. Under normal circumstances, Dutch oyster farmers would not have hesitated to import foreign oysters to continue their trade. But shortly after the winter disaster, the threatened industry was further discouraged by cancellation of the Government's project to develop an artificial oyster-rearing basin. (The artificial rearing project was said to have failed because of changes in the structure of the Delta flood control project.)

It was reported in the fall of 1963 that only 13 of the 150 Dutch oyster farmers would continue their culture. The others had

various choices. Indemnification was expected from the Government. Some were reported to be planning to switch to mushroom farming. Others were discussing the possibility of seeking new areas for oyster cultivation in foreign countries. (Fishing News, October 4, 1963.)

Note: See Commercial Fisheries Review, November 1961 p. 58.

**Nicaragua****SPINY LOBSTER FISHING REGULATIONS ESTABLISHED:**

By a decree, effective November 20, 1963, the Government of Nicaragua has established regulations on spiny lobster fishing in Nicaraguan waters. The regulations are as follows:

Article 1. It is forbidden to catch, buy, keep, process, store, transport, sell, and export lobsters which show external eggs, as well as to remove them by any means.

Article 2. It is forbidden to catch lobsters whose length is inferior to 20 centimeters (7.9 inches), measured from the "pinzers" to the terminal part of the tail.

Article 3. Upon the violation of the dispositions contained in the present decree, when reported by the respective inspector, the Director of Natural Resources of the Ministry of Economy is authorized to impose a fine on the violator, not higher than Five Thousand Cordobas (\$5,000 or about US\$714) and not less than One Thousand Cordobas (\$1,000 or about US\$143). In case of repetition of the offense, the imposed fine can be increased to double in each case. The payment will be effective by law.

Besides the established sanctions in the above paragraph, the respective authorities can impose on the offender the following penalties: thirty days of arrest, confiscation of the seized lobster, of the working implements, and the cancellation of the license or fishing permit.

Article 4. In case of arrest, referred to in the above article, the police judges

Nicaragua (Contd.):

will be competent in their respective jurisdictions, admitting all proofs and resources established by the Law. (United States Embassy, Managua, December 12, 1963.)



Norway

EXPORTS OF CANNED FISH,
JANUARY 1-SEPTEMBER 28, 1963:

Norway's total exports of canned fish in January 1-September 28, 1963, were 10.5 percent less than in the same period of 1962. The decline affected all of Norway's principal canned fish products.

| Norwegian Exports of Canned Fish, January 1-September 28, 1962-63 | | |
|--|------------------|--------|
| Product | 1/1963 | 1962 |
| | . (Metric Tons). | |
| Brisling | 3,782 | 4,479 |
| Small sild | 10,289 | 10,781 |
| Kippered herring | 2,318 | 3,175 |
| Soft herring roe | 621 | 719 |
| Sild delicatessen | 321 | 369 |
| Other canned fish | 2,410 | 2,428 |
| Shellfish | 1,147 | 1,388 |
| Total | 20,888 | 23,339 |
| 1/Preliminary. | | |

In 1963, the small sild canning season opened on May 2. By October 26, 1963, the small sild pack amounted to 537,087 standard cases, up 15.6 percent from the pack of 464,470 cases in the same period of 1962.

The 1963 brisling packing season extended from June 4 to October 15. At the close of the 1963 season, a total of 276,904 standard cases of canned brisling had been packed, a decline of 33.6 percent from the pack of 416,887 cases in the previous year. The Norwegian brisling catch was rather poor in the fall of 1963.

The production of canned mackerel up to October 12, 1963, amounted to 1,365 metric tons as compared with 2,062 tons by the same date in 1962. (Norwegian Cannery Export Journal, November 1963.)

* * * * *

PROPOSED REFINANCING OF
STATE-CONTROLLED
FISH-PROCESSING COMPANY:

A Government proposal for the refinancing of A/S Finmark og Nord-Troms Fiskeindustri (FiNoTro), a fish-processing company operating seven plants in the Troms and Finmark Counties of northern Norway, was submitted to the Norwegian Storting (Parliament) in late 1963. More than 90 percent of the stock of FiNoTro is owned by the Government and the rest of the shares are held by various fishing unions and the Norwegian Society of Cooperatives. The proposed refinancing would provide FiNoTro with N. Kr. 12 (US\$1.7 million) to modernize its plants, and Kr. 2.5 million (\$350,000) to settle certain debts. A total of Kr. 10 million (\$1.4 million) of the company's Kr. 14.5 million (\$2.0 million) share capital is considered lost and is to be written off. The Storting was asked to grant Kr. 12 million (\$1.7 million) in the current fiscal year for new share capital in FiNoTro, and to authorize the Norwegian Ministry of Finance to transfer Kr. 2.5 million (\$350,000) from a special fisheries fund to FiNoTro. The remainder of the capital needed will be supplied by the other shareholders in FiNoTro. The bill also recommends certain measures designed to improve the efficiency of the company, including a reorganization of its management. Two of the seven plants making up FiNoTro are to be closed down. (United States Embassy, Oslo, Norway, December 7, 1963.)



Panama

SPINY LOBSTER EXPLORATORY
FISHING PROJECT CONCLUDED:

M/V "Pelican" Cruise 16 (December 5-19, 1963): The last survey of stocks of spiny lobsters off Panama by the chartered commercial fishing vessel Pelican was conducted during a 2-week cruise in December 1963 when experimental and simulated commercial lobster fishing was carried out in the northwest section of the Gulf of Panama. The cruise off Panama was one of a series conducted by the U. S. Bureau of Commercial Fisheries through an interagency agreement with the U. S. Agency for International Development (AID) Mission to Panama as an Alliance for Progress program.

Panama (Contd.):

The total catch during the cruise in December 1963 amounted to 2,847 lobsters (2,758 pounds). The catch was composed of 1,034 spiny lobsters (*Panularis gracilis*) or 1,255 pounds, and 1,813 rock lobsters (*Scyllarides* sp.) or 1,503 pounds.

The first week of the cruise was devoted to training and involved the use of 180 wood-slat traps. During that time, 154 lobsters (227 pounds) were caught.

During the second week, operations were centered in the San Carlos-Rio Hato area where trawling on rocky bottom was conducted with a 40-foot shrimp trawl rigged with plastic mud rollers and a tickler chain. Of the total of 45 drags (averaging 90 minutes each), 40 were successful in taking lobsters. The total trawling catch was 990 spiny and 1,803 rock lobsters. The best drag produced 207 lobsters. Gear damage was limited to 1 torn net and 4 broken tickler chains.

Comparative drags made during daylight and nighttime revealed no discernable differences in catch rate, indicating good possibilities for successful round-the-clock commercial fishing.

The presently unused rock lobster, which is of excellent quality in both meat yield and flavor, appears suitable for commercial exploitation.

A brief visit was made to the scallop fleet which was working the beds discovered during Pelican Cruise 15 in September 1963. The 15 vessels in the area were each fishing with two 6-foot dredges. Due to high catch rates, the fishermen were allowing only 5 to 7 minutes per drag. Full vessel loads were being taken in two days of fishing, working only during daylight hours.

The M/V Pelican was scheduled to return to the United States in early 1964.

Note: See Commercial Fisheries Review, December 1963 p. 76.



Peru

FISHING INDUSTRY
LONG-RANGE FORECAST:

In Peru, an annual growth rate of 5 percent for the tuna industry and 12 percent for

the fish meal industry during the current decade is predicted by the Peruvian National Society of Industries in a publication based upon material from the Peruvian Central Reserve Bank's study "Programacion del Desarrollo."

The forecast of 5 percent growth in the tuna industry for the period 1961 to 1971 was based on estimated domestic Peruvian consumption alone. Increased Japanese competition in foreign tuna markets could limit the growth of Peruvian export tuna sales.

It was estimated that the international market for fish meal could reach 3 million metric tons per year by 1967. Assuming Chilean production may reach 550,000 tons, Icelandic 150,000 tons, South African 230,000 tons, and other countries 300,000 tons, the demand for Peruvian meal could still reach 2 million tons. This assumption was the basis for the prediction that Peruvian fish meal production increases for the period 1961 to 1971 should average 12 percent per annum. The future of fish oil production was viewed as uncertain, and no estimate was made of possible increases. Production of sperm oil and whale meal will remain about at present levels, according to the forecast. (United States Embassy, Lima, December 5, 1963.)

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ESTIMATED EXPORTS OF FISH MEAL
AND FISH OIL, 1963:

Unpublished estimates of Peru's 1963 exports of fish meal and fish oil were: fish meal, 1,160,000 metric tons; fish oil, 106,863 tons. Fish meal stocks on hand as of September 30, 1963, were estimated to be 114,659 tons. No estimates were given on stocks of fish oil on hand as of that date.

Although Peru's production of fish meal in 1963 was expected to be less than earlier predicted, the January-October 1963 production was well ahead of the same period a year earlier (903,437 metric tons as against 819,638 tons).

Exports of fish meal in 1963 were up from 1962 as a result of the good world demand, and stocks of both fish meal and fish oil at the end of 1963 were expected to be lower than usual. (United States Embassy, Lima, December 20, 1963.)

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Peru (Contd.):

FISH MEAL EXPORT AGREEMENT EXTENDED:

By the Supreme Decree of December 12, 1963, the Peruvian Government ratified for another three years the international fish meal export agreement which was originally signed in Paris on October 1, 1960, by representatives of the Peruvian National Fisheries Society (Sociedad Nacional de Pesqueria) and the international Fish Meal Exporters Organization (FEO).

FEO establishes quotas for fish-meal exporting countries in order to maintain a balance between supply and demand. Under the original Paris agreement, Peru was allocated an export quota of 600,000 metric tons. Due to the rapid expansion of the fish meal market, the Peruvian quota has been steadily increased, having been set at 1 million long tons for 1963 and 1.2 million long tons for 1964. (United States Embassy, Lima, January 3, 1964.)

**Poland****LANDINGS OF MARINE PRODUCTS AND SIZE OF FISHING FLEET, 1962-63:**

Poland's target for ocean fish landings in 1963 was reported by the periodical *Zycie Warszawy* of December 13, 1963, to be more than reached. The prediction was that the 1963 marine fish landings would be at least 207,000 metric tons. As a result of the good landings, market supplies for home consumption increased. The target for the 1964 ocean fish landings has been set at 222,000 tons.

| Type of Vessel | 1962 | 1961 | 1960 | 1955 | 1950 |
|---------------------------------------|---------------------|--------|--------|--------|--------|
| | (Number of Vessels) | | | | |
| Factory trawlers | 5 | 2 | 1 | - | - |
| Super trawlers ¹ | 66 | 57 | 53 | 8 | - |
| Other trawlers | 9 | 11 | 13 | 20 | 24 |
| Lugger-trawlers | 46 | 46 | 50 | 34 | - |
| Luggers | 1 | 3 | 3 | 3 | 3 |
| Cutters | 545 | 538 | 532 | 397 | 338 |
| Auxiliary vessels | 3 | 3 | 3 | 2 | - |
| Total | 675 | 660 | 655 | 464 | 365 |
| Total Gross Registered Tons | 104,900 | 91,700 | 87,600 | 43,200 | 18,200 |

¹/Motor type B-20, steam type: B-14 and B-10.

In 1962, Poland's marine fish landings were down 3.1 percent from the previous

year due to a sharp decline in the herring catch. Cod landings, however, were up substantially from 1961 and there were good increases for sprats and other species.

| Fishery | 1962 | 1961 | 1960 | 1959 | 1950 |
|----------------------|---------------|---------|---------|---------|--------|
| | (Metric Tons) | | | | |
| Groundfish | 47,300 | 40,800 | 51,100 | 40,300 | 48,200 |
| Herring | 76,100 | 93,600 | 93,600 | 52,000 | 9,500 |
| Sprats | 13,700 | 11,300 | 9,900 | 5,100 | 1,200 |
| Other | 27,100 | 23,600 | 13,400 | 9,700 | 7,300 |
| Total | 164,200 | 169,300 | 168,000 | 107,100 | 66,200 |

Poland's fleet of sea fishing vessels continued to expand in 1962. The fleet gained 3 factory trawlers that year, as well as 9 super trawlers, and 7 cutters. There was a decline in the number of smaller trawlers and vessels classified as "luggers." The gross registered tonnage of the fishing fleet in 1962 was 14.4 percent greater than in 1961, and was about five times greater than in 1950. (*Concise Statistical Yearbook of Poland, 1963.*)

Note: See *Commercial Fisheries Review*, February 1963 p. 87.

**Portugal****CANNED FISH EXPORTS, JANUARY-SEPTEMBER 1963:**

Portugal's total exports of canned fish during the first 9 months of 1963 were down 7.8 percent from those in the same period of 1962, due primarily to lower exports of sardines. The decline was partly offset by a considerable increase in exports of mackerel. Sardines accounted for 73.7 percent of the 1963 exports of canned fish, followed by mackerel with 9.8 percent, anchovy fillets with 7.4 percent, tuna and tuna-like fish with 5.6 percent, and chinchards with 2.9 percent.

| Product | January-September | | | |
|---------------------------|-------------------|-------------|-------------|-------------|
| | 1963 | | 1962 | |
| | Metric Tons | 1,000 Cases | Metric Tons | 1,000 Cases |
| In Oil or Sauce: | | | | |
| Sardines | 33,924 | 1,785 | 39,305 | 2,067 |
| Chinchards | 1,341 | 71 | 1,626 | 85 |
| Mackerel | 4,504 | 180 | 1,722 | 69 |
| Tuna and tuna-like | 2,590 | 86 | 2,833 | 94 |
| Anchovy fillets | 3,434 | 343 | 4,253 | 425 |
| Others | 258 | 14 | 214 | 11 |
| Total | 46,051 | 2,479 | 49,953 | 2,751 |

Portugal's principal canned fish buyers during January-September 1963 were Italy

Portugal (Contd.):

with 7,664 metric tons, followed by Germany with 7,397 tons, the United Kingdom 5,276 tons, the United States 5,073 tons, France 3,931 tons, and Belgium-Luxembourg 2,992 tons. (Conservas de Peixe, November 1963.)

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**CANNED FISH PACK,
JANUARY-SEPTEMBER 1963:**

Portugal's total pack of canned fish in oil or sauce in the first 9 months of 1963 was down about 25 percent from that in the same period of 1962. The decline was due mainly to a sharp drop in the pack of sardines.

| Portuguese Canned Fish Pack, January-September 1962-1963 | | | | |
|--|-------------------|--------------|---------------|--------------|
| Product | January-September | | | |
| | 1963 | | 1962 | |
| | Metric Tons | 1,000 Cases | Metric Tons | 1,000 Cases |
| In Oil or Sauce: | | | | |
| Sardines | 19,818 | 1,043 | 30,781 | 1,620 |
| Chinchards | 2,315 | 123 | 2,724 | 143 |
| Mackerel | 5,414 | 216 | 5,838 | 233 |
| Tuna and tuna-like | 5,381 | 180 | 4,856 | 162 |
| Anchovy fillets . . | 2,956 | 296 | 3,938 | 394 |
| Others | 347 | 18 | 433 | 23 |
| Total | 36,231 | 1,876 | 48,570 | 2,575 |

Landings of sardines in January-September 1963 totaled 65,285 tons. For January-August, tuna landings were 905 tons and bonito 154 tons--mostly used for canning. (Conservas de Peixe, November 1963.)



South-West Africa

**QUOTAS FOR 1963 AND 1964
PILCHARD FISHERY INCREASED:**

The Walvis Bay fishing industry in South-West Africa has been granted an additional pilchard quota of 60,000 short tons for the 1963 season, to be divided equally among the six factories. This makes a total quota for the 1963 season for the pilchard industry of 600,000 tons, 100,000 tons per factory. By the end of August the total catch was 433,285 tons.

In announcing this extra quota the South-West Africa Administration stipulated that it would not be a permanent increase.

The extra quota prolonged the season at Walvis Bay for another month and the first factories closed early in October.

Most of the production from this extra quota was reduced to fish meal and used to meet an order from Japan for 20,000 tons of fish meal. Delivery of this order was due late in 1963 or early in 1964. It is also understood that the Japanese have been very impressed with the quality of South African fish meal.

The extra quota had to be granted to enable the industry to meet this order, as earlier production was sold in advance. It was estimated that at the end of the normal season the industry had about 5,000 tons of fish meal on hand.

The extra 60,000 tons have been given on the licenses of the two new fishing concerns in South-West Africa which were licensed by the Administration to catch and process pilchards into fish meal and oil. This means that the existing six factories will pay a share to the new companies for use of part of their quota.

At the time the new firms were licensed it was decided to fix the permanent yearly quota for the South-West African pilchard industry at 90,000 tons per factory, or 720,000 tons for the industry.

The two new factories must be in full production by the start of the 1965 season and may in the meantime work their quota through an existing factory. (The South African Shipping News and Fishing Industry Review, October 1963.)



Sweden

**FISHING INDUSTRY TRENDS, 1962,
AND ESTIMATE FOR 1963:**

Summary: An oversupply of herring in 1963 forced prices down and checked the record prosperity experienced by the Swedish fishing industry in 1962. The large herring landings in 1963 were expected to result in new limitations on landings by both Sweden and Denmark. The extension of fishing limits by other countries has not yet affected Swedish fishermen, but an agreement made with Norway will handicap Swedish shrimp fishermen in 1965. No large change in the structure of the Swedish fishing fleet is expected within the next few years.

Sweden (Contd.):

| Species | Quantity | | Value | | | |
|-----------------------------|---------------|---------|--------------|------------|--------------|------------|
| | 1962 | 1961 | 1962 | | 1961 | |
| | | | 1,000 S. Kr. | US\$ 1,000 | 1,000 S. Kr. | US\$ 1,000 |
| | (Metric Tons) | | | | | |
| Herring . . . | 145,121 | 133,435 | 86,685 | 16,676 | 66,029 | 12,703 |
| Baltic herring | 16,520 | 16,100 | 11,104 | 2,136 | 10,727 | 2,064 |
| Sprat | 5,054 | 4,949 | 4,589 | 883 | 4,473 | 861 |
| Cod | 30,600 | 30,839 | 22,552 | 4,339 | 22,770 | 4,380 |
| Haddock . . . | 3,321 | 4,410 | 3,993 | 768 | 4,918 | 946 |
| Whiting . . . | 3,051 | 1,468 | 2,328 | 448 | 1,263 | 243 |
| Ling | 1,227 | 1,214 | 1,696 | 326 | 1,550 | 298 |
| Other cod species . . . | 4,270 | 3,612 | 4,458 | 858 | 4,043 | 778 |
| Flatfish . . . | 3,308 | 3,137 | 5,427 | 1,044 | 5,176 | 996 |
| Mackerel . . . | 14,627 | 13,593 | 10,796 | 2,077 | 8,719 | 1,677 |
| Eel | 1,742 | 1,911 | 12,413 | 2,388 | 11,403 | 2,194 |
| Salmon | 1,339 | 1,564 | 6,078 | 1,169 | 7,586 | 1,459 |
| Shrimp | 5,724 | 4,462 | 25,763 | 4,956 | 20,304 | 3,906 |
| Othershellfish | 1,534 | 1,774 | 5,879 | 1,131 | 5,862 | 1,128 |
| Unclassified fish | 4,073 | 4,009 | 5,166 | 994 | 5,120 | 985 |
| Industrial fish | 41,433 | 26,255 | 7,316 | 1,407 | 4,336 | 834 |
| Total | 282,944 | 252,732 | 216,243 | 41,600 | 184,279 | 35,452 |

^{1/}Includes landings in foreign ports.

| Species | Landings in Swedish Ports | | Landings in Foreign Ports | |
|-----------------------------|---------------------------|---------|---------------------------|--------|
| | 1962 | 1961 | 1962 | 1961 |
| | (Metric Tons) | | | |
| Herring | 51,766 | 62,556 | 93,355 | 70,879 |
| Baltic herring | 16,520 | 16,100 | - | - |
| Sprat | 4,872 | 4,736 | 182 | 213 |
| Cod | 29,005 | 30,118 | 1,595 | 721 |
| Haddock | 2,779 | 3,946 | 542 | 464 |
| Whiting | 1,742 | 1,158 | 1,309 | 310 |
| Ling | 1,210 | 1,196 | 17 | 18 |
| Other cod species | 2,961 | 2,787 | 1,309 | 825 |
| Flatfish | 3,186 | 3,055 | 122 | 82 |
| Mackerel | 5,405 | 6,780 | 9,222 | 6,813 |
| Eel | 1,742 | 1,911 | - | - |
| Salmon | 1,339 | 1,564 | - | - |
| Shrimp | 5,712 | 4,460 | 12 | 2 |
| Other shellfish | 1,528 | 1,773 | 6 | 1 |
| Unclassified fish | 3,719 | 3,637 | 354 | 372 |
| Industrial fish | 31,958 | 21,883 | 9,475 | 4,372 |
| Total | 165,444 | 167,660 | 117,500 | 85,072 |

Landings: In 1962, Swedish fishery landings were up 12.0 percent in quantity and 17.3 percent in value from those in 1961, due to heavier direct foreign landings and higher prices in foreign ports. But in 1963 an over-supply of herring filled cold-storage plants, drove prices down, and caused Swedish fishermen's income to drop by almost 30 percent. Limitations on landings in Swedish and Danish ports in 1963 were imposed too late to prevent market gluts. In the first half of 1963, direct landings by Swedish vessels in Danish and West German ports totaled 66,813 metric tons as compared with 45,345 tons in the same period of the previous year.

Foreign Trade: In 1962, Danish over-all exports of fishery products (including direct landings in foreign ports) were up 15.7 percent in quantity and 29.8 percent in value from those in 1961. Again, the increase in exports was due mainly to larger direct landings in foreign ports by Swedish vessels. Export landings and shipments of fresh and frozen fish accounted for almost 97 percent of the total exports. The leading buyer of Swedish fishery products was Denmark, followed by West Germany and East Germany.

Swedish imports of fishery products in 1962 were up 11.2 percent in value from those in 1961, but the quantity was almost the same in both years. Norway was the leading supplier of Swedish fishery imports, followed by Denmark and Iceland.

Fishing Fleet: The value of the Swedish fishing fleet in 1961 was calculated to be S. Kr. 217.5 million (US\$41.9 million) for fishing craft and Kr. 76.4 million (\$14.7 million) for gear, indicating a total investment of Kr. 293.9 million (\$56.6 million). It was estimated that in 1962 the value of fishing vessels increased by 25 percent and that of gear by 3 percent. In the first half of 1963, only 1 new

| Product | 1962 | | | 1961 | | | 1960 | | |
|---|----------------|--------------|-------------------|----------------|--------------|-------------------|----------------|--------------|-------------------|
| | Million S. Kr. | Million US\$ | 1,000 Metric Tons | Million S. Kr. | Million US\$ | 1,000 Metric Tons | Million S. Kr. | Million US\$ | 1,000 Metric Tons |
| Fresh and frozen fish | 100.1 | 19.2 | 149.0 | 76.3 | 14.7 | 128.7 | 69.1 | 13.3 | 119.5 |
| Fresh and frozen fish fillets | 0.9 | 0.2 | 0.4 | 1.0 | 0.2 | 0.4 | 1.0 | 0.2 | 0.3 |
| Salted, spiced, or sugar-salted herring | 2.9 | 0.5 | 2.0 | 2.0 | 0.4 | 1.6 | 3.5 | 0.7 | 3.4 |
| Other salted, dried, and smoked fish | 0.4 | 0.1 | 0.0 | 0.4 | 0.1 | 0.0 | 0.5 | 0.1 | 0.1 |
| Shellfish | 1.4 | 0.3 | 0.5 | 1.0 | 0.2 | 0.5 | 1.0 | 0.2 | 0.4 |
| Canned fish and shellfish | 9.9 | 1.9 | 2.0 | 8.2 | 1.6 | 1.8 | 8.2 | 1.6 | 1.9 |
| Other prepared fish products | 1.1 | 0.2 | 0.3 | 1.0 | 0.2 | 0.2 | 1.8 | 0.3 | 0.5 |
| Total | 116.7 | 22.4 | 154.2 | 89.9 | 17.4 | 133.3 | 85.1 | 16.4 | 126.1 |

^{1/}Included are direct landings by Swedish fishermen in foreign ports: in 1962--117,500 metric tons, valued at Kr. 69.9 million (US\$13.4 million); in 1961--85,300 metric tons, valued at Kr. 40.6 million (\$7.8 million); and in 1960--66,100 metric tons, valued at Kr. 30.2 million (\$5.8 million).

Sweden (Contd.):

| Country of Destination | 1962 | 1961 | 1960 |
|--|--------------------------|------|--------|
| | (Million Swedish Kronor) | | |
| Denmark | 74.3 | 35.3 | 25.5 |
| East Germany | 11.1 | 18.4 | 21.5 |
| France | 2.5 | 1.4 | 0.8 |
| United Kingdom | 1.9 | 3.5 | 3.1 |
| Norway | 2.8 | 1.9 | 1.5 |
| United States | 2.5 | 2.8 | 2.6 |
| West Germany | 14.8 | 19.6 | 22.1 |
| Other countries | 6.8 | 7.0 | 7.6 |
| Total Value of Swedish Fishery Exports ^{1/} | 116.7 | 89.9 | 2/84.7 |

1/Includes the value of direct landings in foreign countries.

2/Does not agree exactly with corresponding total in table 3.

steel trawler was delivered as compared with 18 in 1962. It appears that the modernization of the Swedish fishing fleet has leveled off with Swedish fishermen carefully studying market developments before planning further investments.

The number of full-time Swedish fishermen in 1962 was 8,967, only a small decrease from the 9,041 reported the previous year. Better fishery employment opportunities on

the west coast in 1961 halted that area's downward trend and arrested the national decline in fishing employment evident since 1946.

Outlook: Little change in the structure of the Swedish fishing fleet is anticipated in the next few years. The size of vessels used by Swedish fishermen is not expected to exceed 100 feet, the size of the largest trawlers now in use. Modernization of the fleet will continue on a small scale in the form of more powerful engines and more efficient gear and equipment. The number of fishermen is expected to decrease in the areas where fishing is not as profitable as employment in other industries. This will particularly affect the number of fishermen on the east and south coast of Sweden.

Herring: The large herring landings in 1962 and particularly in the summer and fall of 1963 revealed that the organizations concerned with landings and prices do not have sufficient control over the situation during periods when there is an oversupply. Representatives of Swedish and Danish fishery organizations in late 1963 discussed the question of landings in Danish ports. Danish fishermen and their organizations, which had

Table 5 - Swedish Imports^{1/} of Fishery Products, by Commodity Group, 1960-1962

| Product | 1962 | | | 1961 | | | 1960 | | |
|---|----------------|--------------|-------------------|----------------|--------------|-------------------|----------------|--------------|-------------------|
| | Million S. Kr. | Million US\$ | 1,000 Metric Tons | Million S. Kr. | Million US\$ | 1,000 Metric Tons | Million S. Kr. | Million US\$ | 1,000 Metric Tons |
| Fresh and frozen fish | 39.3 | 7.5 | 14.3 | 33.3 | 6.4 | 14.0 | 31.1 | 6.0 | 13.0 |
| Fresh and frozen fish fillets | 26.5 | 5.1 | 8.1 | 18.1 | 3.5 | 5.9 | 17.0 | 3.3 | 5.8 |
| Salted, spiced, or sugar-salted herring | 32.9 | 6.3 | 24.8 | 35.0 | 6.7 | 27.3 | 22.4 | 4.3 | 19.5 |
| Other salted, dried, and smoked fish | 8.1 | 1.6 | 2.1 | 9.2 | 1.8 | 2.7 | 7.0 | 1.3 | 2.2 |
| Shellfish | 8.9 | 1.7 | 2.0 | 7.6 | 1.5 | 1.6 | 5.4 | 1.0 | 1.0 |
| Canned fish and shellfish | 21.0 | 4.0 | 3.7 | 19.5 | 3.7 | 3.4 | 20.1 | 3.9 | 3.4 |
| Other prepared fish products | 9.9 | 1.9 | 2.8 | 9.1 | 1.7 | 3.0 | 8.0 | 1.5 | 3.0 |
| Total | 146.6 | 28.1 | 57.8 | 131.8 | 25.3 | 57.9 | 111.0 | 21.3 | 47.9 |

1/Included are direct landings by Danish fishermen in Swedish ports: in 1962--600 metric tons, valued at Kr. 2.5 million (US\$0.5 million); in 1961--200 metric tons, valued at Kr. 1.6 million (\$0.3 million); and in 1960--100 metric tons, valued at Kr. 0.6 million (US\$0.1 million).

Table 6 - Value of Swedish Imports^{1/} of Fishery Products, by Country of Origin, 1960-1962

| Country of Origin | 1962 | 1961 | 1960 |
|--|--------------------------|-------|---------|
| | (Million Swedish Kronor) | | |
| Canada | 1.7 | 2.0 | 1.8 |
| Denmark | 42.1 | 38.4 | 31.7 |
| East Germany | - | - | 0.1 |
| Iceland | 21.2 | 19.3 | 9.8 |
| Japan | 2.4 | 2.0 | 3.6 |
| Norway | 58.8 | 49.9 | 45.8 |
| Poland | 2.0 | 1.1 | 1.4 |
| Portugal | 3.6 | 3.0 | 2.6 |
| Soviet Union | 7.3 | 7.9 | 8.3 |
| United States | 1.7 | 1.7 | 1.2 |
| West Germany | 1.5 | 2.0 | 1.8 |
| Other countries | 4.3 | 4.5 | 3.1 |
| Total Value of Swedish Fishery Imports | 146.6 | 131.8 | 2/111.2 |

1/Includes the value of direct landings by Danish fishermen in Swedish ports.

2/Does not agree exactly with corresponding total in table 5.

previously neglected limitations on herring landings and the maintenance of minimum prices on herring for consumption, agreed to follow the principles established by Swedish fishermen and their organizations. The heavy landings were partly the result of a good supply of 1960 class herring, but the increase in the number of fishing vessels from Denmark, West and East Germany, and the United Kingdom contributed to the large landings. Swedish fishery organizations have emphasized the importance of having a domestic processing industry with a high capacity, but fluctuations in the market have been a hampering factor.

It has been suggested that Swedish west coast fishermen could change over from fish-

Sweden (Contd.):

ing for herring to fishing for white fish. But the supply of white fish in the North Sea has been smaller than usual and herring fishing is under normal circumstances much more profitable. In addition, the craft and gear used by those fishermen have been adapted particularly to herring fishing.

As can be seen from recent import data (table 5), Sweden imports large quantities of salted, spiced, and sugar-salted herring. Previously, Swedish fishermen were actively engaged in herring fishing with drift nets in Icelandic waters, but for various reasons this type of fishing ceased. In 1963, however, the west coast fishermen's organization put up a guarantee, and 8 west coast trawlers made a 2-months trip to Icelandic waters in order to fish for herring with floating trawls. The experiment was not completely successful as out of an anticipated catch of 4,000 barrels, the vessels returned with only 2,000 barrels of salted herring. Bad weather with heavy storms and a general poor supply of herring were the reasons for the disappointing result. It was proved, however, that it is possible to catch Icelandic herring with floating trawls. The experiment also showed a possible way for the fishing organizations to decentralize fishing areas and landing ports, thus reducing the number of vessels in certain overworked areas and limiting landings in certain ports.

Shrimp: Shrimp fishermen on the northern part of the Swedish west coast will be excluded as of January 1, 1965, from a rich deep-water area in the Oslo Fjord. The west coast fishermen's organization has complained bitterly over the agreement between Norway and Sweden creating the exclusive area and will request financial assistance from the Swedish Government for the loss that fishermen may suffer. The organization has also proposed a Swedish import ban on Norwegian shrimp and crab, claiming that Norwegian fishermen are selling shellfish at prices which make it impossible for Swedish fishermen to compete. (United States Consulate, Goteborg, November 29, 1963.)



Taiwan

SHRIMP EXPORTS INCREASED IN 1963:

Exports of shrimp to Japan and the United States were reported by the Industrial Development and Investment Center of the Republic of China to have amounted to about 250,000 pounds prior to the date of the report (October 31). As of that date, an additional 120,000 pounds were ready for shipment to Japan. The Center estimated that 500,000 pounds of shrimp valued at about US\$500,000 would be exported in 1963. (Taiwan Industrial Panorama, October 31, 1963.)



U.S.S.R.

FISHERIES CATCH GOAL INCREASED FOR 1964:

A 1964 goal of 4.9 million metric tons of fishery landings (including whales and other marine mammals) has been announced by the Soviet press. The 1964 goal represents an increase of about 8.9 percent over the estimated 1963 Soviet catch of 4.5 million tons. In addition to working developed fishing areas in 1964, the Soviet Union plans to send a fishing expedition into the Arabian Sea. Exploratory cruises will be conducted in the East China Sea and in the area off Iceland. (United States Embassy, Moscow, January 3, 1964.)

* * * * *

MARINE FISHERY PRODUCTION GOALS FOR 1963 EXCEEDED:

The Soviet periodical Izvestiya has announced that the 1963 U.S.S.R. plan for production of fish, marine animals (including whales), and other marine fishery products has been fulfilled ahead of schedule, with the total catch for 1963 estimated at 4.5 million metric tons. In 1962, the Soviet catch goal of 3.9 million metric tons was also reached ahead of schedule. (United States Embassy, Moscow, December 6, 1963.)

* * * * *

SPECIFICATIONS OF FISH FACTORYSHIPS BUILT BY WEST GERMAN SHIPYARD:

A contract to build 8 floating fish factories for the Soviet Union was negotiated in August 1963 by the Government-owned shipyard at Kiel, German Federal Republic. Although

U. S. S. R. (Contd.):

press reports at the time of the announcement of the contract stated that the vessels were to be of approximately 17,000 tons deadweight each, shipyard officials now state that the vessels will be of 10,000 tons deadweight each. Other specifications of the vessels: over-all length 545 feet; beam 79 feet; molded draft 49 feet; draft 25 feet; engine 5,600 hp. Diesel; and estimated speed 14 knots.

Unlike the whaling mothership Vladivostok and her sistership the Dalnjij Vostok, which were built for the Soviets by the same shipyard, the 8 vessels on order will not be designed for whaling but will have facilities for processing fish oil, fish meal, and frozen and canned fish.

The vessels are scheduled for delivery during 1965 and 1966 and it is not now known in what areas they will operate. From a technical point of view it is reported that they will be capable of operating in a full arctic to tropic range. (United States Consulate, Hamburg, December 20, 1963.)

Note: See Commercial Fisheries Review, October 1963 p. 67; June 1963 p. 70; February 1962 p. 93.



United Kingdom

CANNED FISH MARKETING TRENDS:

The per capita consumption of canned fish in the United Kingdom increased steadily between 1953 and 1958, rising some 113 percent in the 5-year period. On the other hand, per capita consumption of canned fish in the United Kingdom is still below that in the United States. The relatively smaller use in the United Kingdom offers an opportunity for increasing sales, particularly since the British market for convenience foods is growing.

Imports satisfy 90 percent of the British market for canned fishery products. Between 1958 and 1962, the value of the imports averaged US\$95 million per year with, however, some wide annual fluctuations.

Canned salmon accounts for about two-thirds of British imports of fishery products. Since the removal of exchange

| Value of British Imports of Canned Fishery Products, 1958-1962 and 5-Year Average | | | | | | |
|---|--------------------------|------|------|------|------|-----------------------|
| Canned Fishery Product | 1962 | 1961 | 1960 | 1959 | 1958 | 5-Year Avg. 1958-1962 |
| |(Million US\$)..... | | | | | |
| Salmon..... | 84 | 43 | 60 | 84 | 69 | 68 |
| Brisling & sild sardines, pilchards, & sturgeon roe | 6 | 7 | 7 | 8 | 8 | 7 |
| Other canned fishery products..... | 26 | 17 | 21 | 16 | 20 | 20 |
| Total..... | 116 | 67 | 88 | 108 | 97 | 95 |

controls in 1958, British purchases of canned salmon in the United States have averaged \$6 million per year, varying from \$7 million to \$3 million per year. In 1962, the United Kingdom took about 75 percent of all United States canned salmon exports.

Canned brisling and sild sardines, pilchards, and sturgeon roe imports (which are dominated by exclusive suppliers) account for about seven percent of the value of British canned fishery imports. Excluding those products as well as canned salmon still leaves British canned fishery imports valued at about \$20 million per year. These include various packs of crabs, tuna, shrimp, lobsters, oysters, clams, sardines, roe, fish paste, and other products.

Tuna is not presently a widely recognized canned fishery product in the United Kingdom. Canned tuna imports were valued at only about \$2 million in 1961, the only year for which statistics are available. Peru supplied 80 percent of that total. British tuna consumption is probably less than three percent of canned salmon consumption. However, distributors say consumption is increasing and, in view of the growing importance of convenience foods, there is every reason to believe that high-quality tuna could be marketed on a large scale, if supported by adequate advertising. There is certainly a sales potential at least as a specialty food.

A display of canned fishery products at a Trade Center exhibit in the United Kingdom could attract attention from British distributors, buyers, caterers, and other consumers. Foods other than fish could be included in an exhibit since most buyers and importers handle a variety of lines. (United States Embassy, London, December 13, 1963.)

* * * * *

STERN TRAWLING REVIEWED AT CONFERENCE:

"Stern trawling" was the subject of the first major conference organized by the British White Fish Authority. The meeting was held in Grimsby, England, September 10-11, 1963. The 300 or more delegates from nine countries were a clear indication of the anxiety of both the catching and construction sides of the industry to put stern trawling under the microscope in order to assess its true potential. Although some nations and some individual companies have already made the decision to adopt stern fishing completely, there are still those who regard it as being economic only for large distant-water vessels. This conference offered an ideal opportunity for experiences to be compared and arguments for and against to be put forward.

Many of the delegates were representing ancillary industries such as engine builders, hauling gear manufacturers, and so on, all vitally interested in the various techniques so far employed on stern trawlers, and in their effectiveness. In a comparatively new field such as this, shipbuilder, owner, and gear manufacturer must pool resources in order to achieve the most effective solution for hauling and shooting the trawl.

United Kingdom (Contd.):

The subjects covered by the speakers tended to conform to this pattern. A British speaker set the scene by stating the problems of the trawler owner contemplating his first stern trawler and the economic factors which he has to consider. For the designer, a West German spoke on structural, layout and stability problems and later on hauling methods, trawl deck length, etc. Later speakers described operational experience with existing vessels; a Norwegian described how the Hekktind, Vaagtind, and smaller Hessatral and Hessagut were designed to suit the legislative and economic restrictions of Norway; a Frenchman spoke on the Thalassa and Hiram I and another speaker described Colonel Pleven II. British experience was illustrated by talks on the Junella and on the Fairtry's.

The latter half of the meeting looked toward future trends, with papers from two experts of the White Fish Authority.

Certain key points of discussion were of especial interest, and the views of various speakers on those points follow:

While the stern trawler had undisputed advantages as a long duration freezer vessel, its catching power as a fresh-fish trawler must be compared with that of the less expensive side trawler. Quicker handling of the gear and ability to work in worse weather gave the stern trawler an advantage in time actually spent fishing, but this could be offset by the higher speed of the conventional vessel, which also had a morale-boosting effect on the crew, said one British speaker. In practice, a 13-knot stern trawler compared with a 15-knot side trawler in catching power. Another British speaker had observed a desirable trend on the Junella, namely a higher average age of crew, which suggested that the stern trawler might help solve labor problems, and this was confirmed by another British speaker who had found that stern trawling seemed to attract the crew most suited to it. The Junella spent 327 days out of 365 at sea and with eight men on deck could haul, change a trawl, and shoot again in 30 minutes. The Vaagtind's trawl was on the bottom for 58 percent of her sea time, and the time taken to change a trawl was 10 minutes.

The shelterdeck stern trawler, with its extra freeboard and high ramp aft was inherently safer than a side trawler. This as-

sumed that there were ample freeing ports on deck as that there were no 'tween deck apertures open. There was little evidence to show that following seas could be a great danger, but a stern gate could minimize the risk; fish hatches must be able to be closed quickly, and though pneumatics were fast, they could freeze. Hydraulics can do the job in four seconds, however. A safety gate of the Fairtry type, which rose vertically by hydraulic power, could clear most cod end bags at a man's waist height so that he has something to grasp if swept aft. Stability was good on a stern trawler and there was less danger from icing.

It should not be imagined that the stern trawler's warps always lay fair behind her. Angles of 90 degrees to the vessel had been experienced and with the towing point so far aft, manoeuvring was difficult. One solution suggested was a bow propeller or "thruster," utilizing spare electric capacity when towing. The other possibility was a rudder nozzle, unless some method could be found of taking the towing strain further forward.

For the same reasons, it was difficult to come round on fouled gear as a side trawler could. Most could be cleared by hauling the ship back over the gear and using sheer force, though the Fairtry ships, with their after galleys, had found it possible to go astern between the warps, and so tow the gear free. It was important that the shape of the stern and the design of the warp fairleads was such that up-and-down warps and warps at 90 degrees horizontal angle should not chafe the hull plating.

Opinion was general that, in order to get the trawl aboard in no more than three heaves, the slip deck, or trawl deck should be as long as possible--75 feet being favored as a minimum. However, as one speaker pointed out, it was questionable whether the one heave eliminated by carrying the deck right forward was worth the loss of weather protection. The advantage of the Colonel Pleven II observation bridge wing was considerable, however. As for the system whereby the bight of the net was left trailing aft, the speaker thought this would be a drawback when having to change grounds or steam back over the tow. He thought there was a risk of over-complication of hauling gear, and enumerated no less than 10 wires and messengers which had to be operated. To use independent, specialized winches and capstans would mean 7 of these--too much for remote control by one man. Proper-

United Kingdom (Contd.):

ly arranged through divided fairleads, they offered no problem to the whipping drums. The Fairtry's had used an independent cod end winch, with spring accumulator gear to absorb surge and had found it ideal. They also had a warping capstan aft for an out-haul messenger when shooting.

The French speaker described in detail, the special movable warp fairlead fitted to the sides of the Thalassa's ramp to prevent the danleno butterfly fouling the rampslip and to stop chafe between ramp and warp, bridles, etc. This seemed to provoke little interest, possibly because the detailed description suggested a lengthy procedure. In fact, there seemed little to choose between hauling methods, the long-established Fairtry method seeming to hold its own with newer systems. Emphasis was placed on the need for a barrier around which the bobbins could be hove tight to stop them rolling and split cod ends were favored by several speakers--they stopped the "bag" rolling and they halved the chance of loss through torn meshes. The Vagatind had hauled a 35-ton bag without trouble and in one heave. Rollers at the top of the ramp were no longer considered to damage the catch, and saved much chafe. "Ulstrom" was now widely used for the whole trawl and the Norwegian oval trawl door was recommended by British experience.

The split-trawl winch, with mechanically-driven warp guiding gear was generally accepted as the future pattern. There was a wider acceptance, too, of hydraulic power, remote control, and (with one notable exception) multiple specialized winches in key positions. Another British speaker, in discussing the Ross Daring, was quite confident that the skipper could handle the winch from the wheelhouse.

There was some concern over winch brakes. On a side trawler, friction was applied to the warps by their circuitous path round the bollard fairleads, but on a stern trawler the winch brakes took the whole load when paying away the warps. Some improvement had been made on the Fairtry vessels by using special linings, but one British speaker thought that some tensioning system was desirable. A Norwegian discussed the use of regenerative braking, by which the winch drives its motor, which acts as a generator and applies braking effort. However,

this required specially designed worm gear, or better, bevel gear, which would take the reverse loads. Although hydraulics would act in this way, there was a danger of damage should a high pressure system be overspeeded. One speaker reported no trouble, probably due to slower shooting speeds. No mention was made of warp tensioning or metering devices, and the United States-type powered drum for winding on the trawl was criticized on the grounds that net repair and inspection was made difficult.

The conference ended with papers by the two White Fish Authority experts. One of the speakers suggested the need for designing now for the pattern of fisheries which we can expect in, say, 10 years' time. He had in mind the possibility of a greater protection of home grounds and greater exclusion from distant grounds, which could call for a more efficient inshore and near-water fleet. A number of "standard" designs were described, some of which had already been built in Norway. The other British expert discussed the relative merits of various engine arrangements, Diesel electric drive, and stern trawler specification generally.

In closing the meeting, the chairman of the White Fish Authority made an outspoken appeal to trawler owners, asking them to be less secretive and more ready to add their experience to the general pool of knowledge. (World Fishing, November 1963.)

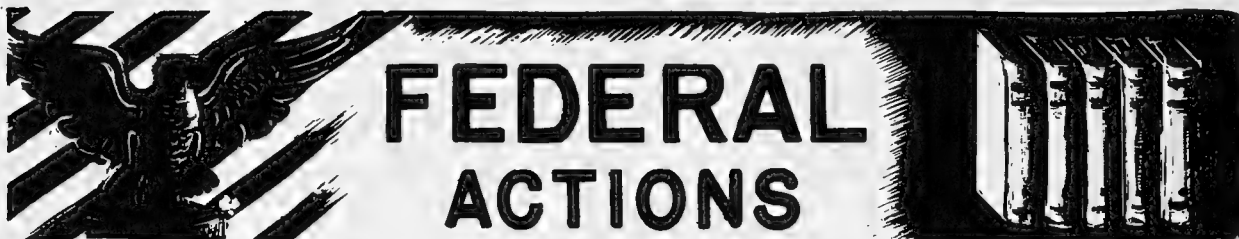


Venezuela

NEW SHRIMP-PROCESSING PLANT:

A new Venezuelan shrimp-processing plant was opened on the west side of the Paraguan Peninsula, northeast of Maracaibo, Venezuela, during the latter part of 1963. The plant capacity is not known. The new firm, which is associated with a Philadelphia fishery firm, plans to process and export shrimp to the United States. The plant is adjacent to the Gulf of Venezuela which, together with Lake Maracaibo, are the principal fishing areas of shrimp vessels operating in Venezuela. (United States Embassy, Caracas, December 24, 1963.)





Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

WILLAPA BAY, WASHINGTON, OYSTER INDUSTRY STUDY APPROVED:

Improved techniques designed to increase the yield of marketable oysters from the Willapa Bay, Wash., area could result from a \$34,170 technical assistance study approved on December 17, 1963, by the Area Redevelopment Administration (ARA). Favorable results could lead to improvements in that industry creating new jobs during the oyster season, when large numbers of workers in logging operations are unemployed. Seasonal shifts between those two industries would be in the unskilled and semi-skilled categories which would not require retraining.

The ARA funds will be used by the Washington State Department of Fisheries for a one-year investigation of problems now blocking economic development in the industry. The three-part project will concentrate on ways to increase the meat yield of oysters, raise the nutrient level of beds through application of chemical fertilizers, and boost production of oyster seeds from local beds.

Willapa Bay is located in Pacific County which was designated as eligible to participate in the ARA program as a small area of persistent and substantial unemployment.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

PUBLIC HEARING ON STANDARDS OF IDENTITY FOR FROZEN RAW BREADED SHRIMP:

A notice of public hearing regarding establishment of definitions and standards of

identity for frozen raw breaded shrimp and frozen raw lightly breaded shrimp was announced by the Food and Drug Administration on December 18, 1963. The notice was published in the Federal Register of Saturday, December 21, 1963. The hearing was originally scheduled for January 20, 1964, at Washington, D. C., but was later postponed to February 17, and was to continue thereafter at such times and places as directed by the hearing examiner. All interested persons were invited to attend the hearing and present evidence.

The changes in hearing and prehearing conference dates were announced by the Food and Drug Administration on January 9 and published in the January 11, 1964 Federal Register.

A prehearing conference for the simplification of the issues, exchange of documentary evidence, the scheduling of witnesses, and such other matters was to be held on January 8, 1964, also in Washington, D. C. The prehearing date was later moved to February 7.

Pertinent sections of the notice of public hearing regarding establishment of definitions and standards of identity for frozen raw breaded shrimp and frozen raw lightly breaded shrimp as shown in the December 21, 1963, Federal Register follow:

A notice of proposed rulemaking was published in the FEDERAL REGISTER of March 31, 1961 (26 F.R. 2722), setting forth the joint petition of the National Fisheries Institute, Inc., 1614 Twentieth Street NW., Washington 9, D.C., and the National Shrimp Breeders Association, Inc., 624 South Michigan Avenue, Chicago 5, Illinois, for the establishment of a definition and standard of identity for frozen raw breaded shrimp. Based upon comments received from interested persons and other information available, an order by the Commissioner of Food and Drugs was published in the FEDERAL REGISTER of May 7, 1963 (28 F.R. 4556), promulgating definitions and standards of identity for frozen raw breaded shrimp (21 CFR 36.30) and fro-

sen raw lightly breaded shrimp (21 CFR 36.31). Objections were filed to the order, and a public hearing was requested as provided in the Federal Food, Drug, and Cosmetic Act (sec. 701(e)(2), 70 Stat. 919; 21 U.S.C. 371(e)(2)). A notice was published on July 6, 1963 (28 F.R. 6915), announcing that objections had been filed and that the order was stayed pending a resolution of the issues at a public hearing.

The Commissioner of Food and Drugs has concluded that the objections state reasonable grounds for a hearing on the following issues:

1. Whether it will promote honesty and fair dealing in the interest of the consumer to require the following minimum amounts of shrimp material:

a. Fifty percent for frozen raw breaded shrimp (21 CFR 36.30) or should the minimum percentage be increased to sixty percent.

b. Seventy percent for frozen raw lightly breaded shrimp (21 CFR 36.31).

2. Whether it will promote honesty and fair dealing in the interest of the consumer, in the label declaration of the food and the optional ingredients, to:

a. Require that a prominent label declaration of optional ingredients shall immediately precede or follow the name of the food, without intervening written, printed, or graphic matter, wherever such name appears on the label so conspicuously as to be easily seen under customary conditions of purchase (21 CFR 36.30(f)).

b. Require the naming of composite units of shrimp (21 CFR 36.30(e)(6)) as "Breaded shrimp cutlets", if cutlet-shaped; "Breaded shrimp sticks", if stick-shaped; and if in a shape other than cutlet or stick, "Breaded shrimp -----", the blank to be filled in with the word or phrase that accurately describes the shape but is not misleading.

c. Permit the item consisting of units prepared from pieces or parts of shrimp to be designated as anything other than "Breaded shrimp pieces" (21 CFR 36.30(e)(5)).

d. Permit as an alternative designation for "Breaded round shrimp" (21 CFR 36.30(e)(3)) which have tail fins on, the designation "Breaded round fan-tail shrimp."

e. Require the size of the raw shrimp used to be listed on the label and to establish standards for size based on the

number of shrimp per pound, including a definition of size for prawns based on number of shrimp per pound.

f. Require the percentage of breaded present to be listed on the label.

g. Require a designation of geographical origin of the raw shrimp.

3. Whether the regulation for the method of determining shrimp material should vary from that prescribed by the United States Department of the Interior in 50 CFR 262.21, specifically:

a. By providing for the use of a rubber-tipped glass stirring rod (21 CFR 36.30(g)(1)(ix)).

b. By the use of the term "+2" instead of "+5" in the formula for calculating the percent of shrimp matter (21 CFR 36.30(g)(2)(ii)).

4. Whether a provision should be added to the standards of identity limiting the time raw frozen shrimp may be held in storage prior to breaded.

Objections were also received referring to absence of regulations for rules for inspections, regarding tolerances for and the handling of "out of grade" packs, and regarding the establishment of a standard of quality. It is the opinion of the Commissioner that these matters are not proper to be included in the proposed standards.

Note: See Commercial Fisheries Review, August 1963 p. 114; June 1963 p. 94.



U. S. Tariff Commission and U. S. Trade Information Committee

HEARINGS HELD ON SOME FISHERY PRODUCTS PRELIMINARY TO 1964 GATT NEGOTIATIONS:

The U. S. Tariff Commission and the U. S. Trade Information Committee began public hearings on December 2, 1963, to permit the United States industry to advise the Government of its interest in the General Agreement on Tariffs and Trade (GATT) negotiations scheduled to be held during 1964 in Geneva. The Tariff Commission scheduled the following organizations of the United States fisheries industry for oral appearances and testimony on December 11, 1963: Alaska Fishermen's Union; Association of Pacific Fisheries; American Tunaboat Association; Tuna Research Foundation; Maine Sardine Packers Association; Romanoff Caviar Company; and the Alaska King Crab Association.

The Tariff Commission is to advise the President as to the probable economic effects of possible tariff reductions on United States industries producing like or directly competitive articles. The public hearings were an important part of the Commission's investigation and collection of information.

Hearings by the Trade Information Committee (an inter-agency body chaired by a representative of the Office of Special Representative for Trade Negotiations), will cover all aspects of the tariff-swapping sessions, including the lowering of trade barriers on articles on the United States public list. The Committee hopes to be able to focus on determining which foreign tariffs and trade restrictions are most burdensome to United States exporters and should be reduced or eliminated in the interest of expanding United States exports.

The Notice of Investigation and Hearings was announced by the Tariff Commission on October 22, 1963, and published in the Federal Register of that date, as follows:

TARIFF COMMISSION

[TEA-221(b)-1]

PRESIDENT'S LIST OF ARTICLES FOR POSSIBLE CONSIDERATION IN TRADE AGREEMENT NEGOTIATIONS

Notice of Investigation and Hearings

1. Tariff Commission public hearings will begin on December 2, 1963.
2. The final date for filing requests to testify at the Tariff Commission public hearings is November 20, 1963.

On October 22, 1963, the President, pursuant to section 201(a) of the Trade Expansion Act of 1962 (hereinafter referred to as "the Act"), furnished the United States Tariff Commission there-

inafter referred to as "the Commission") a list of articles (hereinafter referred to as the "President's list") to be considered for modification or continuance of United States duties or other import restrictions, or continuance of United States duty-free or excise treatment, in connection with trade-agreement negotiations to be conducted under the Act. The President's list is published in the FEDERAL REGISTER concurrently with this notice.¹

I. Investigation instituted. In accordance with Part 205 of the Commission's rules of practice and procedure, the Commission has instituted an investigation for the purpose of obtaining, to the extent practicable, information of the kind described in section 221(c) of the Act for use in connection with the preparation of advice to the President required by section 221(b) of the Act, namely, advice with respect to each article included in the President's list of the Commission's judgment as to the probable economic effect of modifications of duties or other import restrictions on industries producing like or directly competitive articles.

II. Procedure for conduct of hearings and submission of written views. A. Public hearings in connection with the investigation will commence at 10:00 a.m. on Monday, the 2d day of December, 1963, in the Hearing Room, Tariff Commission Building, 8th and E Streets NW, Washington, D.C.

1. Requests to appear at the public hearings must be filed in writing with the Secretary of the Commission on or before November 20, 1963. Such requests must contain the following information:

a. The item number or numbers in the Tariff Schedules of the United States covering the article or articles on which testimony will be presented.

b. The name and organization of the witness or witnesses who will testify, and the name, address, telephone number, and organization of the person filing the request.

c. A statement indicating whether the testimony to be presented will be on behalf of importer or domestic-producer interests.

d. A careful estimate of the aggregate time desired for presentation of oral testimony by all witnesses for whose appearances the request is filed.

2. Allotment of time: Because of the extensive scope of the President's list, limitation of time for the presentation of oral testimony is in the public interest. Accordingly, in scheduling appearances at the hearings the time to be allotted to witnesses for the presentation of oral testimony will be limited as circumstances require. Supplemental written statements will be allowed in all cases, and should be submitted at the time of presentation of oral testimony.

3. Notification of date of appearance: Persons who have properly filed requests to appear will be individually notified in advance of the date on which they will be scheduled to present oral testimony and of the time allotted for presentation of such testimony.

4. Order of hearings: To the extent practicable the hearings will follow the order of the Tariff Schedules of the United States, beginning with Schedule 1. **Animal and Vegetable Products.**

¹See Presidential Notice of October 21, 1963, *supra*.

5. Questioning of witnesses will be limited to members of the Commission.

B. Written information and views in lieu of appearance at the public hearings may be submitted by interested persons. A signed original and nineteen true copies of such statements shall be submitted. Business data which it is desired shall be treated as confidential shall be submitted on separate sheets, each clearly marked at the top "Business Confidential." All written statements, except for confidential business data, will be made available for inspection by interested persons. To be assured of consideration by the Commission, written statements in lieu of appearance should be submitted at the earliest practicable date, but not later than the date of the closing of the public hearings.

III. Requests for reservation of certain items from negotiations. Under conditions set forth in section 225(b) of the Act, certain articles included in the President's list must be reserved by the President from negotiation for the reduction of duty or other import restriction or the elimination of duty. This reservation provision applies to any article with respect to which (1) the Commission, in escape-clause proceedings concluded prior to October 11, 1962, found by majority vote that it was being imported in such increased quantities as to cause or threaten serious injury to an industry, (2) there was not in effect on October 11, 1962, any action taken under section 7 of the Trade Agreements Extension Act of 1951, (3) a request in behalf of the industry concerned is filed with the Commission not later than 60 days after publication of the President's list, and (4) the Commission finds and advises the President that economic conditions in such industry have not substantially improved since the date of the report of the finding referred to in (1).

A. Articles subject to request for reservation under section 225(b) of the Act are listed in the Annex to this notice.

B. Requests for reservation may be filed by or on behalf of any firm or firms which in 1962 accounted for more than 50 percent of the production (by quantity) of the domestic article concerned in an escape-clause investigation which resulted in a majority Commission finding of serious injury or the threat thereof. Interested persons who intend filing requests are urged to do so within the time specified in part II A 1 for the filing of requests to appear at the public hearings in connection with the President's list. Persons doing so will be allowed additional time for the presentation of evidence at the hearings. (Note § 205.9 of the Commission's rules of practice and procedure (19 CFR 205.9) which provides that investigations for the purposes of section 225(b) of the Act will be consolidated with the investigation for the purposes of section 221 of the Act.)

C. Requirements for requests. Requests for reservation shall include the following: (1) The names and addresses of the firms known by the persons filing the request to be producing the domestic article concerned, and the location of the separate establishments, if any, of such firms in which such article is produced; (2) data on production by quantity of the domestic article concerned for each of the years 1958 through 1962; and (3) a statement of the facts form-

ANNEX—ARTICLES REFERRED TO IN PART III OF TARIFF COMMISSION NOTICE

[NOTE: "TSUS" refers to "Tariff Schedules of the United States"; "pt" after an item number means that only part of the item is involved]

| TSUS Item No. | Articles | Number and date of Tariff Commission report |
|---------------|--|---|
| 110.80 | Cod, cusk, haddock, hake, pollock, and Atlantic ocean perch (rosedick), "otherwise processed". | 7-47 |
| 110.85 | | 10/12/56 |
| 128.23 | Alsike clover seed | 1-10401-2 |
| 136.30 | Garlic | 5/8/57 |
| | | 177, 2d Ser. |
| | | 6/8/52 |
| 186.20 | Fur, not on the skin, prepared for haters' use, and carotined furskins. | 178, 2d Ser. |
| | | 11/9/51 |
| 346.15 | Velveteens, of cotton | 7-49 |
| 346.20 | | 10/24/56 |
| 346.22 | | 7-19 |
| 346.24 | | 4/13/53 |
| 372.65(pt) | Screen-printed scarves, of silk | 7-69 |
| 425.94 | Tartaric acid | 7-14/59 |
| 426.76 | Cream of tartar | 7-70 |
| 532.21(pt) | Ceramic mosaic tiles (except such tiles valued at 85 cents or more per square foot, and except tiles in sheets (1) containing over 300 tiles per square foot, or (2) having none, or not more than half, of the tiles with faces which (disregarding rounded corners) are in the form of triangles, rectangles, or polygons and with such triangles, rectangles, or polygons as there may be forming an integral part of the pattern). | 7-100 |
| | | 5/10/61 |
| 600.91 | Scissors and shears and blades therefor, valued over \$1.75 per dozen. | 7-24 |
| | | 3/12/54 |
| 725.04(pt) | Viollins and violas valued not over \$25 each. | 7-55 |
| | | 1/29/57 |
| 732.02 | | |
| 732.04 | | |
| 732.06 | | |
| 732.08 | | |
| 732.10 | | |
| 732.12 | | |
| 732.14 | | |
| 732.16 | | |
| 732.18 | | |
| 732.20 | | |
| 732.22 | | |
| 732.24 | | |
| 734.55(pt) | Bicycles | 7-37 |
| | | 3/14/55 |
| 745.52 | Baseball (including softball) gloves and mitts. | 7-97 |
| | | 5/1/61 |
| | | 7-52 |
| | | 1/30/57 |
| | | 7-109 |
| | | 2/22/62 |
| 751.20(pt) | Dressmakers' or common pins | 7-62 |
| 751.25(pt) | | 1/14/58 |
| | Ribs and stretchers of metal for umbrellas or parasols of the kind commonly carried in the hand when in use, in frames or otherwise, and tubes (rods) for such umbrellas, whether or not of metal. | |
| 755.35(pt) | Ferrocerium and other cerium alloys. | 7-41 |
| | | 12/21/55 |
| 756.20(pt) | Tobacco pipes and pipe bowls of brier wood or root, valued not over \$5 per dozen. | 7-10 |
| | | 12/22/52 |
| 790.05 | Spring type clothespins | 7-57 |
| | | 9/10/57 |

ing the basis of the claim that economic conditions in the industry producing the domestic article concerned have not improved since the date of the report of the Commission which contained the finding of serious injury or the threat thereof.

IV. Related hearings before the Trade Information Committee. Published in the FEDERAL REGISTER concurrently with this notice is an announcement by the Trade Information Committee² regarding public hearings to be held by the Committee on the articles included in the President's list, and on other matters, to begin on December 2, 1963. Oral testimony and written statements of interested persons received by the Commission in connection with its investigation for the purposes of section 221 of the Act will be made available by the

²See FR. Doc. 63-11183, in Notices section, *supra*.

Commission to the Trade Information Committee. Accordingly, as stated in the Trade Information Committee's notice, appearance before the Trade Information Committee for the purpose of submitting the same information, although permissible, will not be necessary.

V. *Communications to be addressed to Secretary.* All communications regarding the Commission's investigation should be addressed to the Secretary, United States Tariff Commission, Washington, D.C., 20436.

Issued October 22, 1963.

By direction of the United States Tariff Commission.

[SEAL]

DONN N. BENT,
Secretary.



U. S. Tariff Commission

HEARINGS ON EXCLUSION OF GROUND FISH AND OCEAN PERCH FILLETS FROM TARIFF MODIFICATION:

The U. S. Tariff Commission on December 23, 1963, announced hearings for January 28, 1964, to determine whether or not groundfish and ocean perch fillets (cod, cusk, haddock, hake, pollock, and Atlantic ocean perch, under Tariff Schedules of the United States Item Nos. 110.50 and 110.55) will be eligible for exclusion from the President's list of articles up for tariff modification in the forthcoming trade negotiations under the General Agreement on Tariffs and Trade.

The Notice of Investigations and Hearings announced by the Tariff Commission on December 26, was published in the Federal Register of December 27, 1963.

Note: Earlier, on December 11, 1963, fishing industry representatives appeared before the U. S. Tariff Commission and the Trade Information Committee to give testimony as to why their products should or should not be included on the negotiating list for possible tariff reductions which the United States will take to the GATT conference scheduled to open in Geneva in May 1964.



Department of the Treasury

HALIBUT STEAKS FROM JAPAN NOT BEING SOLD AT LESS THAN FAIR VALUE:

A determination that halibut steaks from Japan are not being, nor likely to be, sold in the United States at less than fair value within the meaning of section 201 (a) of the Antidumping Act, 1921, as amended (19 U. S. C. 160 (a)), was announced by the U. S. Depart-

ment of the Treasury on December 12, 1963. The statement of reasons as published in the Federal Register of December 27, 1963, follows:

Statement of reasons: The imported product is halibut steak. The quantity of halibut steaks sold for home consumption is inconsequential. Dressed halibut, however, is sold for home consumption. The dressed halibut is deemed to be similar to halibut steaks within the meaning of the Antidumping Act. The quantity of dressed halibut sold for home consumption was sufficient to furnish a basis for a fair value comparison.

There is no relationship between the seller and the purchaser in the United States within the meaning of section 207 of the Antidumping Act.

The appropriate comparison for fair value purposes, therefore, is between purchase price and adjusted home market price.

Purchase price was computed by deducting inland freight and shipping charges from the f.o.b. Japanese port price.

Adjusted home market price was computed by adding to the price of dressed halibut in the home market, the cost of processing it into steaks. The proceeds from the sale of certain by-product wastes produced in the manufacture of the steak were deducted. An addition was made to reflect the additional cost resulting from the fact that the halibut steak yield was less than 100 percent of the dressed halibut. The extra cost of export packing was also added.

Purchase price was found to be not lower than adjusted home market price.

The determination was the result of a complaint received by the Treasury Department that halibut steaks from Japan were being sold in the United States at less than fair value within the meaning of the Antidumping Act of 1921.

* * * * *

PUBLIC HEARING HELD ON ANTIDUMPING REGULATIONS:

A public hearing on Treasury Department regulations (19 CFR 14.6-14.13) now in effect under the Antidumping Act (19 U. S. C. 160-173) was held on January 23, 1964, at Washington, D. C.

The Notice of Hearing dated December 19, 1963, that the Treasury Department is presently reviewing its regulations on the Antidumping Act was published in the Federal Register of December 24, 1963.



Eighty-Eighth Congress (First and Second Sessions)

CONGRESS ADJOURNS: After the longest session in 20 years, the first session of the 88th Congress adjourned sine die on Dec. 30, 1963. The second session of this Congress will convene on Jan. 7, 1964. All pending legislation before either the Senate or House will retain its status as of adjournment and will be subject to further consideration in the second session. Bills introduced in the first session do not have to be reintroduced. Bills that were reported out of a committee or passed by one body of the Congress remain in status quo and do not have to again retrace their legislative steps.



CONGRESS RECONVENES: The second session of the 88th Congress convened on Jan. 7, 1964.

FOOD-FOR-PEACE, AND FISH: The President on Dec. 16, 1963, signed H. R. 7885, an act to amend further the Foreign Assistance Act of 1961 (P. L. 88-205). Included in this law is a provision for the inclusion of domestically-produced fishery products under Public Law 480 (Sec. 403 (c)). This would amend section 106 of the Agricultural Trade Development and Assistance Act of 1954 (P. L. 480) to include, in title I and title IV programs, any domestically-produced fishery product if the Secretary of the Interior determines that the product at the time of export is excess of domestic requirements, adequate carry-over, and anticipated exports for dollars. Fish flour (fish protein concentrate) will not be included until approved by the Food and Drug Administration. The amendment with respect to title I will not become effective until Jan. 1, 1965.

IMPORT COMMODITY LABELING: The President on Jan. 1, 1964, vetoed H. R. 2513, to amend the Tariff Act of 1930 to require certain new packages of imported articles to be marked to indicate the country of origin, and for other purposes. In a statement explaining his veto of the labeling measure, the President said it would: (1) "Raise new barriers to foreign trade and invite retaliation against our exports at a time when we are trying to expand our trade and improve Western unity; (2) "Impose new costs on merchants and consumers; (3) "Saddle new and unworkable burdens upon our Bureau of Customs at a time when we are trying to reduce Government expenditures. . . ." The President also stated "there is no need for this bill" because the Federal Trade Commission already has authority to require disclosure of the foreign origin of articles offered for sale in this country whenever "there may be danger of deception of the purchaser." The President's statement appeared in the Congressional Record of Jan. 7, 1964, pp. 5 and 6.

NORTH PACIFIC FUR SEAL CONVENTION: On Jan. 16, 1964, Senator Fulbright (Arkansas) announced

from the floor of the Senate that hearings would be held by the Committee on Foreign Relations on Jan. 21, 1964, concerning the protocol amending the North Pacific Fur Seal Convention.

PRICE-QUALITY STABILIZATION: The Special Subcommittee of the Senate Committee on Commerce will resume hearings on Jan. 22 and 23, 1964, on S. 774, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution, and to confirm, define and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes.

RUSSIAN TRAFFIC IN UNITED STATES TERRITORIAL WATERS: Russian Trawler Traffic in United States Territorial Waters (Hearings before the Subcommittee for Special Investigations of the Committee on Armed Services, House of Representatives, 88th Congress, 1st Session), 129 pp., printed. Contains hearings held July 9 and 10, 1963, on Russian trawler traffic in territorial waters of the United States, particularly on the coast of Florida; and testimony or statements of various Government officials and members of Congress.

SHELLFISH INDUSTRY PROBLEMS: Molluscan Shellfish (Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant and Marine and Fisheries, House of Representatives, 88th Congress, 1st Session), 234 pp., printed. Contains hearings held Oct. 2 and 3, 1963, to consider the problems confronting the oyster industry and to appraise all the problems besetting the molluscan shellfish industry. Also contains the statements or testimony of various Government agencies, state governments, and industry people.

SMALL BUSINESS DISASTER LOANS: The House on Jan. 16, 1964, received the report (H. Rept. 1097) from the Committee on Banking and Currency on S. 1309, to amend the Small Business Act to increase the revolving fund and broaden disaster loan authority. The bill, which was passed by the Senate on Nov. 21, 1963, contains an amendment which would provide disaster loans to firms which have "suffered substantial economic injury as a result of the inability of such concern to process or market a product for human consumption because of disease of toxicity occurring in such a product through natural or undertermined causes."

STATE DEPARTMENT APPROPRIATIONS FY 1964: Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriations, 1964 (Hearings before the Subcommittee of the Committee on Appropriations, United States Senate, 88th Congress, 1st Session), 1,208 pp., printed. Contains hearings held on H. R. 7063, making appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies for the fiscal year ending June 30, 1964, and for other purposes. Included in the funds for the Department of State are appropriations for the International Fisheries Commissions.

H. R. 7063, was passed by the House June 18, 1963, and by the Senate, with amendments, Dec. 12, 1963.

S. Rept. 747, Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriation Bill, 1964 (Dec. 5, 1963, Report from the

Committee on Appropriations, United States Senate, 88th Congress, 1st Session), 35 pp., printed. Contains the report of the Committee and the various amendments.

A conference on H. R. 7063 by the Committee of Conference was held on Dec. 17, 1963, and was reported (H. Rept. 1056) to the respective Houses on the same date.

H. Rept. 1056, Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriation Bill, 1964 (Dec. 17, 1963, a Conference Report from the Committee of Conference, House of Representatives, 88th Congress, 1st Session, to accompany H. R. 7063), 7 pp., printed. The Committee of Conference came to agreement and presented their recommendations to the respective Houses. Included in the appropriations for the Department of State are funds for the International Fisheries Commissions for which the Committee of Conference recommended \$2,000,000, an increase of \$90,000 over the amount approved in FY 1963, but \$53,000 less than the amount requested by the State Department. The allocations for the Commissions are shown in the tabulation.

| | Requested FY 1964 | Approved FY 1964 | Approved FY 1963 |
|-------------------------------------|----------------------|---------------------|---------------------|
| Inter-American Tropical Tuna . . | 399,000 | 392,100 | 354,000 |
| International Pacific Halibut . . . | 194,350 | 187,100 | 355,300 |
| International Pacific Salmon . . . | 363,000 | 344,500 | 241,900 |
| Northwest Atlantic Fisheries . . . | 6,000 | 6,000 | 6,000 |
| International Whaling | 900 | 900 | 900 |
| North Pacific Fisheries | 24,800 | 24,800 | 19,000 |
| Great Lakes Fisheries | 1,051,050 | 1,030,700 | 919,000 |
| North Pacific Fur Seal | 1,900 | 1,900 | 1,900 |
| Expenses, U. S. Commissioners . . | 12,000 | 12,000 | 12,000 |
| Total | \$2,053,000 | \$2,000,000 | \$1,910,000 |

The Senate and the House agreed to the Conference Report Dec. 18, 1963. The President on Dec. 30, 1963, signed H. R. 7063 into Public Law 88-245.

SUGGESTED CHANGES INVITED IN TARIFF SCHEDULES OF UNITED STATES OF AUGUST 31, 1963: The Chairman of the Committee on Ways and Means, House of Representatives, on December 13, 1963, announced that the Committee had invited interested persons and groups to submit, in writing, to the Committee suggested revisions and changes in the Tariff Schedules of the United States (TSUS) which became effective August 31, 1963.

The suggested changes and revisions were to be limited to those provisions of the TSUS wherein it appears that through (1) oversight or inadvertence or (2) lack of information, errors have been made or clarifying language may be necessary.

The suggested changes and revisions were not to include matters which were timely presented to the Tariff Commission in connection with their Customs Simplification Study and were considered by the Commission, unless the factors in the paragraph above were involved. The suggested changes were also not to include matters presented to the Committee on Ways and Means when the proposed new tariff schedules were being formulated in 1961.

The Chairman stated that the purpose of the written statements would be to enable the Committee on Ways and Means to determine whether or not certain changes and revisions should be made where there have been errors, inadvertences, or a lack of sufficient information at the time the schedules were adopted by the Congress.



Created in 1849, the Department of the Interior--America's Department of Natural Resources--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

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FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR.- FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

| Number | Title |
|----------|---|
| CFS-3214 | - Shrimp Landings, November 1962, 8 pp. |
| CFS-3258 | - Massachusetts Landings, March 1963, 7 pp. |
| CFS-3259 | - Massachusetts Landings, April 1963, 7 pp. |
| CFS-3309 | - Texas Landings, 1962 Annual Summary, 6 pp. |
| CFS-3320 | - Frozen Fishery Products, September 1963, 8 pp. |
| CFS-3325 | - Great Lakes Fisheries, 1962 Annual Summary, 9 pp. |
| CFS-3332 | - Fish Sticks and Fish Portions, July-September 1963, 2 pp. |
| CFS-3333 | - Maryland Landings, August 1963, 4 pp. |
| CFS-3334 | - Virginia Landings, August 1963, 4 pp. |
| CFS-3335 | - Louisiana Landings, August 1963, 3 pp. |
| CFS-3336 | - Georgia Landings, September 1963, 3 pp. |
| CFS-3337 | - North Carolina Landings, September 1963, 4 pp. |
| CFS-3338 | - Michigan Landings, July 1963, 3 pp. |
| CFS-3339 | - Mississippi Landings, August 1963, 3 pp. |
| CFS-3341 | - South Carolina Landings, September 1963, 3 pp. |
| CFS-3342 | - Texas Landings, April 1963, 3 pp. |
| CFS-3343 | - Texas Landings, May 1963, 3 pp. |
| CFS-3347 | - Rhode Island Landings, August 1963, 3 pp. |
| CFS-3348 | - Maine Landings, August 1963, 4 pp. |
| CFS-3349 | - Fish Meal and Oil, September 1963, 2 pp. |
| CFS-3350 | - Florida Landings, September 1963, 8 pp. |
| CFS-3351 | - Michigan Landings, August 1963, 3 pp. |
| CFS-3353 | - Chesapeake Fisheries, 1962 Annual Summary, 7 pp. |
| CFS-3354 | - Maryland Landings, September 1963, 4 pp. |
| CFS-3355 | - Ohio Landings, August 1963, 3 pp. |
| CFS-3359 | - Alabama Landings, August 1963, 4 pp. |
| CFS-3364 | - Shrimp Landings, July 1963, 7 pp. |

Wholesale Dealers in Fishery Products (Mississippi River and Tributaries), 1962 (Revised):

SL-32 - Minnesota, 2 pp.
SL-36 - Iowa, 2 pp.

Sep. No. 698 - Mechanizing the Blue Crab Industry - Part III - Strengthening the Industry's Economic Position.

Sep. No. 699 - Foreign Fisheries Briefs.

FL-455 - Blue Sac Disease of Fish (Also Known as Dropsy, Yolk Sac Disease and Hydrocoele Embryonalis), by Ken Wolf, 5 pp., illus., revised May 1963.

FL-553 - Delicatessen Fish Products, by Norman D. Jarvis, 7 pp., illus., printed, August 1963. Presents recipes for the preparation of large quantities of fish salads, fish and crab cakes, marinated salmon, and other fish dishes.

FL-556 - Saltonstall-Kennedy Act, as Amended (an excerpt from Title 15 of the United States Code), 4 pp., September 1963. Contains Sec. 713c-3. Provides for the promotion of the free flow of domestically-produced fishery products.

FL-557 - Fish and Wildlife Act of 1956, as Amended (an excerpt from Title 16 of the United States Code), 10 pp., September 1963.

SSR-Fish. No. 414 - Zooplankton Volumes Off the Pacific Coast, 1959, by James R. Thraikill, 79 pp., illus., processed, April 1963.

SSR-Fish. No. 447 - The Spiny Dogfish (*Squalus acanthias*) in the Northeastern Pacific, by Dayton L. Alverson and Maurice E. Stansby, 28 pp., illus., processed, July 1963.

SSR-Fish. No. 465 - Stream Catalog of Southeastern Alaska, Regulatory Districts Nos. 3 and 4, edited by Russell F. Orrell, Carl Rosier, and Lyle R. Simpson, 239 pp., illus., processed, August 1963.

Index of Fishery Biological Papers by U. S. Fish and Wildlife Service Authors Appearing in Nongovernmental Publications, 1940-56, by Lola T. Dees, Circular 151, 140 pp., illus., 1963.

Let's Get Hot with Cool Tuna, Load Up on These Hot Selling Tips for Cool Cash Returns, Special Fisheries Marketing Bulletin, 2 pp., illus., 1963.

Quick Cool Tuna for Long Hot Summer, Take It Easy with Tuna, Special Fisheries Marketing Bulletin, 2 pp., illus., 1963.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, WYATT BLDG., SUITE 611, 777 14TH ST. NW., WASHINGTON, D. C. 20005.

| Number | Title |
|--------|--|
| MNL-10 | - Swedish Fisheries, 1962/63, 13 pp. |
| MNL-12 | - Major Developments in Peru's Fishing Industry, 1962/63, 19 pp. |
| MNL-13 | - India's Fishing Industry, 1962, 23 pp. |
| MNL-85 | - Iran's Fishing Industry, 1963, 9 pp. |
| MNL-86 | - Hong Kong Fishing Industry, 1962/63, 22 pp. |

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, September 1963, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, October and November 1963, 18 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the months indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, November 1963, 8 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, October 1963, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 1014, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, October 1963, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

New England Fisheries--Monthly Summary, November 1963, 21 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--October 1963, 19 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks; for the month indicated.

Pacific Game Fishing Atlas, by James L. Squire, Circular 174, 28 pp., illus., printed, 1963. (Tiburon Marine Laboratory, U. S. Bureau of Sport Fisheries and Wildlife, P. O. Box 98, Tiburon, Calif. 94920.) A synoptic presentation of the most important marine fishing areas in California, Oregon, Washington, Alaska, and Hawaii. In addition to locating areas for the different kinds of game fish, the locations of surf fishing areas, kelp beds, artificial reefs, fishing piers and barges, ramps, and charter boat and rental skiffs are pinpointed.

Halibut and Troll Salmon Landings, and Ex-Vessel Prices for Seattle, Alaska Ports and British Columbia, 1963-1962, 35 pp., December 1963. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., Seattle, Wash. 98104.) Gives landings and ex-vessel prices of troll salmon and halibut at leading United States ports of the Pacific Coast; ex-vessel halibut prices and landings at leading British Columbia ports; United States and Canadian Pacific Coast halibut landings, 1936-1963; Seattle season averages of ex-vessel halibut prices, 1954-1963; and troll salmon landings and receipts at Seattle and Alaska ports, with comparative data.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, November 1963, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ADDITIVES:

Specifications for Identity and Purity of Food Additives. Vol. 1--Antimicrobial Preservatives and Antioxidants, printed, 1962. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

ALASKA:

1962 Alaska Commercial Fisheries Catch and Production Statistics, by P. E. Chitwood, Statistical Leaflet No. 5, 19 pp., printed, 1963. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska.

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"Antibiotic Activity of Some Marine Algae of Puerto Rico," by P. R. Burkholder, L. M. Burkholder, and L. R. Almondovar, article, Botanica Marina, vol. 2, no. 1/2, 1960, pp. 149-156, printed in English with German and French summaries. Studiengesellschaft zur Erforschung von Meeresalgen, e.V. Hamburg, Germany.

"How to Fight Algae," by William S. Service, Jr., article, Aquarium Journal, vol. XXXIV, no. 9, September 1963, pp. 387-388, 390, printed. San Francisco Aquarium Society, Inc., Steinhart Aquarium, Golden Gate Park, San Francisco 18, Calif.

"The Protein Quality, Digestibility, and Composition of Algae, Chlorella 71105," by Joseph A. Lubitz, article, Journal of Food Science, vol. 28, March-April 1963, pp. 229-232, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

ANCHOVY:

La Pesca de la Anchoveta--Estadística de Pesca y Esfuerzo en Abril, Mayo y Junio de 1962 (The Anchovy Fishery--Statistics of the Fishery and Fishing Effort in April, May, and June 1962), by W. F. Doucet, G. Saetersdal, and I. Vasquez A., Report No. 5, 11 pp., illus., processed in Spanish, 1962. Library, Instituto de Investigación de los Recursos Marinos, P. O. Box 3734, Lima, Peru.

La Pesca de la Anchoveta--Estadística de Pesca y Esfuerzo en Enero, Febrero y Marzo de 1962 (The Anchovy Fishery--Statistics of the Fishery and Fishing Effort in January, February, and March 1962), by W. F. Doucet, G. Saetersdal, and I. Vasquez A., Report No. 2, 11 pp., illus., processed in Spanish, 1962. Library, Instituto de Investigación de los Recursos Marinos, P. O. Box 3734, Lima, Peru.

La Pesca de la Anchoveta--Estadística de Pesca y Esfuerzo en Octubre, Noviembre y Diciembre de 1961 (The Anchovy Fishery--Statistics of the Fishery and Fishing Effort in October, November, December 1961), by W. F. Doucet, G. Saetersdal, and I. Vasquez A., Report No. 1, 14 pp., illus., processed in Spanish, 1962. Library, Instituto de Investigación de los Recursos Marinos, P. O. Box 3734, Lima, Peru.

Synopsis of Biological Data on Anchovy, ENGRAULIS ENCRASICOLUS (Linnaeus), 1758 (Mediterranean and Adjacent Seas), by N. Demir, FAO Fisheries Synopsis No. 26, 43 pp., illus., processed, February 1963. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

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Nutrition of Pigs and Poultry (Proceedings of the University of Nottingham Eighth Easter School in Agricultural Science), edited by J. T. Morgan and D. Lewis, 375 pp., printed, 70s. (about US\$9.80). Butterworth and Co. (Publishers) Ltd., Bell Yard, Temple Bar, London WC2, England, 1962.

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"Pelagic Gadoid Fish in the Antarctic," by N. R. Merrett, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 52, no. 9, September 1963, pp. 245-247, illus., printed. Hvalfangerforeningen, Sandefjord, Norway.

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"Evaluation of Antioxidants by a Rapid Polarographic Method," by J. W. Hamilton and A. L. Tappel, article, Journal of the American Oil Chemists' Society, vol. 40, February 1963, pp. 52-54, printed. American Oil Chemists' Society, 35 E. Wacker Dr., Chicago 1, Ill.

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Aquatic Weeds; Their Identification and Methods of Control, by A. C. Lopinot, Fisheries Bulletin No. 4, 47 pp., printed, 1963. Illinois Department of Conservation, Springfield, Ill.

"Biological Controls for Water-Weeds," by Roy A. Grizzell, Jr. and William W. Neely, article, Transactions of the Twenty-Seventh North American Wildlife and Natural Resources Conference, pp. 107-113, printed. Wildlife Management Institute, Wire Bldg., Washington 5, D. C., 1962.

"The Grip of the Water Hyacinth," by A. D. Evans, article, New Scientist, vol. 19, no. 358, September 26, 1963, pp. 666-668, illus., printed. Cromwell House, Fulwood Pl., High Holborn, London WC1, England. Abnormal growth of water weeds can interfere with fishing, seriously reduce fish populations by deoxygenating the water and blocking the spawning grounds, and lead to increased populations of disease-carrying water snails. A native of Brazil, the water hyacinth now threatens many rivers in Africa and Asia.

AUSTRALIA:

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Coastal Investigations at Port Hacking, New South Wales, 1960, by A. D. Crooks, Oceanographical Station List, vol. 52, 137 pp., processed, 1963. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

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U. S. Department of Commerce, Washington, D. C., 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses Government policies on investment, external capital, and aiding industry; expropriation and compensation; land tenure regulations; rights of aliens; regulations governing entry and repatriation of capital; tariff policy; and laws regarding the various types of business organization. Also covers patent licensing; mining laws; regulations affecting employment; the various forms of taxation to which businesses are subject; and the availability of factory sites.

Manufacturing Industries, 1961-62, No. 23--Meat and Fish Preserving, by K. M. Archer, 10 pp., processed, October 3, 1963. Commonwealth Bureau of Census and Statistics, Canberra, Australia.

The Results of an Expedition to Bernier and Dorre Islands, Shark Bay, Western Australia, in July 1959, by W. D. L. Ride and others, Fauna Bulletin No. 2, 128 pp., illus., printed, 1962. Fisheries Department, 108 Adelaide Terrace, Perth, Western Australia.

Seventh Annual Report on the Operation of the Fishing Industry Act 1956 during the Year Ended 30th June, 1963, 8 pp., processed. Department of Primary Industry, Canberra, Australia. This report outlines the operations of the Fisheries Development Trust Account, established for the purpose of financing activities designed to foster the development of the Australian fishing industry, for the year ended June 30, 1963. It discusses the shrimp fishery in the Gulf of Carpentaria, research on sperm whales off Western Australia, training school for fisheries field officers, tuna long-lining, and Western Australian spiny lobster biological research.

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"The Bloodworm Industry in the Maritimes," by M. C. Cormier, article, Trade News, vol. 16, no. 2, August 1963, pp. 3-5, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

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"Effects of Copper Ion on Oxygen Uptake by Planktonic Cyprids of the Barnacle, Balanus amphitrite niveus," by Francis J. Bernard and Charles E. Lane, Contribution No. 465, 3 pp., illus., printed. (Reprinted from Proceedures of the Society for Experimental Biology and Medicine, vol. 113, 1963, pp. 418-420.) University of Miami, Marine Laboratory, Institute of Marine Science, 1 Rickenbacker Causeway, Miami 49, Fla.

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Market for U. S. Products in Belgium (Supplement to International Commerce), by Robert H. Walker, 60 pp., illus., printed, 45 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., February 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Provides general marketing information on Belgium, guidance on prospects for sales of selected commodities of special interest, and related material essential to

the U. S. businessman preparing to sell goods in Belgium. Includes a section on the market for frozen and convenience foods.

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"Autoxidation of Beef and Tuna Oxymyoglobins," by W. Duane Brown and Ami Dolev, article, Journal of Food Science, vol. 28, March-April 1963, pp. 207-210, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"Flavors from Fat," article, Food Processing and Packaging, vol. 31, no. 369, 1962, pp. 212-217, printed. Putman Publishing Co., 111 E. Delaware Pl., Chicago 11, Ill.

BOTULISM:

"FDA Investigating Botulism Outbreak from Smoked Whitefish," article, FDA Report on Enforcement and Compliance, October 1963, p. 18, processed. Food and Drug Administration, U. S. Department of Health, Education, and Welfare, Washington, D. C. 20201.

BRAZIL:

Pesca--1961, Estrutura e Producao (Fishing Industry, 1961, Structure and Production), 45 pp., processed in Portuguese. Ministerio da Agricultura, Servico de Estatistica da Producao, Rio de Janeiro, Brazil, April 1963.

BUFFALOFISH:

Consumer Acceptance of Fresh Buffalo Fish, by W. R. Morrison, Report Series No. 116, 24 pp., printed, 1963. Agricultural Experiment Station, University of Arkansas, Fayetteville, Ark.

CALIFORNIA:

A Historical Review of the Fish and Wildlife Resources of the San Francisco Bay Area, by John E. Skinner, Water Projects Branch Report No. 1, 236 pp., illus., printed, June 1962. Water Projects Branch, Department of Fish and Game, The Resources Agency of California, 722 Capitol Mall, Sacramento, Calif. 95814. Discusses the fishing ports; the early history of the commercial fisheries; the fisheries from 1870 to 1915, and from 1915 to the present; the fisheries of the Bay area today--schooling and pelagic fish, flatfish, bottomfish; sharks and skates, salt-water perch, croakers, molluscan and crustacean fisheries, freshwater fish, anadromous commercial fisheries; and economic aspects of the commercial fisheries. A section on anadromous fisheries covers king salmon, silver salmon and steelhead trout, striped bass, sturgeon, and American shad. The section on molluscan fisheries includes information on oysters, clams, abalone, and marine borers. The section on the crustacean fisheries discusses crabs, shrimp, and freshwater crayfish. The freshwater fisheries and marine mammals of the area are discussed. Included are many statistical tables giving historical data on various aspects of the fisheries.

CANADA:

Canadian Fisheries Reports, no. 2, October 1963, 31 pp., illus., printed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Includes articles on: "Factors Affecting the Efficiency of Antibiotic Dips for Fresh Fish Fillets," by C. M. Blackwood, J. Liston, and J. A. Stern; "A Critical

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Survey of Differential Media for the Demonstration of Coagulase-Positive Staphylococci in Food," by N. Neufeld and R. Garm; "Coliform Contamination in Lobster Meat Traced to Cooler Construction," by John M. Graham; and "Quality Changes in Vacuum Packed and Non-Vacuum Packed Frozen Lobster Meat during Storage at Different Temperatures," by W. A. Murphy and H. L. Newson.

Fishes of Ontario, by H. H. MacKay, 300 pp., printed, 1963. Department of Lands and Forests, Toronto, Ontario, Canada.

Fishing and Hunting in Canada, 1961, by D. A. Benson, 25 pp., printed, 1963. Canadian Wildlife Service, National Parks Branch, Department of Northern Affairs and National Resources, Ottawa, Canada. A report on an economic survey.

Rapport Annuel, 1962 (Annual Report, 1962), 209 pp., printed in French, 1963. Station de Biologie Marine, Grande-Riviere, Quebec, Canada.

"Trends in Canadian Atlantic Fisheries," by R. U. Mahaffy, article, Canadian Fisherman, vol. 50, no. 11, November 1963, p. 17, printed, single copy C\$2.. National Business Publications Ltd., Gardenvale, Que., Canada.

"Trends in Canadian Atlantic Mainland Fisheries Past, Present, and Future," by W. R. Martin, article, Trade News, vol. 16, no. 2, August 1963, pp. 8-15, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

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"Cools Cans Three Times Faster," article, Food Processing, vol. 23, no. 6, 1962, pp. 37-38, printed. Putman Publishing Co., 111 E. Delaware Pl., Chicago 11, Ill.

"Spin Processing of Canned Foods," article, Food Preservation Quarterly, vol. 22, no. 3, 1962, pp. 76-77, printed. Commonwealth Scientific and Industrial Research Organization, Division of Food Preservation, P. O. Box 43, Ryde, N. S. W., Australia.

"Vacuum Sealing Machine with Gas Supply, article, Technological Digests, vol. 7, no. 4, 1962, p. 67, printed. Organisation for Economic Co-Operation and Development, 2 Rue Andre Pascal, Paris, France.

CARP:

"Kanibalizm u Lychynok i Mal'kiv Sazana" (Cannibalism among the Larvae and Fry of the Carp), by O. I. Kudryns'ka, article, Dopovidi Akad. Nauk Ukrain. R. S. R., vol. 1, 1962, pp. 111-113, printed in Russian. Academy of Science of the Ukrainian SSSR, Kiev, Ukraine, U. S. S. R.

CASPIAN SEA:

"Pump Fishing in the Caspian Sea," article, Fishing News International, vol. 2, no. 3, July-September 1963, p. 304, illus., printed, single copy 6s. 6d. (about 85 U. S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England.

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Riesenfische, Wale und Delphine (Giant Fishes, Whales and Dolphins), by J. R. Norman and F. C. Fraser, 342 pp., illus., printed in German, 1963. Verlag Paul Parey, Spitalerstrasse 12, Postfach 1129, 2000 Hamburg 1, Federal Republic of Germany. (Also available in an English edition from Putnam, 42 Great Russell St., London WC1, England.) Part I of this book is concerned with fishes, such as sharks, rays, perch-like fishes, barracuda, etc. Part II is concerned with cetaceans, such as whales, porpoises, and dolphins. The book includes a description of the better known forms but does not necessarily include every animal in these families. A biological description of these classes of animals is given for ready use to identify those that are covered. The book is designed to help the layman and scientist to make quicker and more ready identification.

--Walter H. Stolting

CEYLON:

Administration Report of the Director of Fisheries for 1961-62, Part IV--Education, Science and Art (L), 70 pp., printed in Sinhalese and English, 2/40 (about 55 U. S. cents), August 1963. Government Publications Bureau, P. O. Box 500, Secretariat, Colombo, Ceylon. Reports on the activities of the Ceylon Department of Fisheries for 1961-62. Includes information on programs of the organization, disputes and regulations, loans to fishermen, cooperative societies, coastal navigation aids, and fishing harbors. Also covers fresh- and brackish-water fisheries, pearl fisheries, Mutwal fisheries factory and harbor, trawler fishing, and fishery research. Included are statistical tables giving data on production of fresh-water and marine fish, mechanized fishing vessels, and imports and exports of fishery products.

CLAMS:

Seasonal Growth of the Northern Quahog, MERCENARIA MERCENARIA, and the Southern Quahog, M. CAMPECHIENSIS, in Alligator Harbor, Florida, by R. W. Menzel, Contribution No. 184, 10 pp., illus., processed. (Reprinted from Proceedings of the National Shellfish Association, vol. 52, 1961, pp. 37-46.) Oceanographic Institute, Florida State University, Tallahassee, Fla. Monthly shell length measurements were made of Mercenaria mercenaria for 3.5 years and of M. campechiensis for 2 years, in Alligator Harbor, Franklin County, Florida. The northern clams were laboratory-reared natives of Long Island Sound. They showed the best growth recorded for any locality, with greatest growth in spring and fall, less in winter, and least in summer. The southern clams, which originated in Alligator Harbor, grew faster than the northern species, with greatest growth in spring and fall, almost as much in summer, and least in winter.

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"Kolichestvonnaya Otsenka Skoplenii Baltiiskoi Treski s Podoshch'yu Ekholota" (Quantitative Assessment of Cod Concentrations in the Baltic Using Sonar), by K. I. Yudanov, article, Rybnoe Khoziaistvo, no. 1, 1962, pp. 26-32, printed in Russian. VNIRO Glavni-proekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

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"Laanemere Tursk Randab." (Migrations of the Baltic Cod), by I. Stsukina, article, Eesti Loodus, vol. 6, 1961, pp. 361-363, printed in Estonian Academy of Sciences of the Estonian SSSR, Tartu, U. S. S. R.

"Svyaz' Hidrologicheskikh Uslovii s Kolebaniyami Chislennosti Pokolenii Treski" (Relationship between Hydrological Conditions and Fluctuations in the Numbers of Successive Year-Classes of Cod), by A. G. Kislyakov, article, Trudy Soveshchaniy Ikhtiologicheskoy Komissii Akad. Nauk SSSR, vol. 13, 1961, pp. 260-264, printed in Russian. Akademiya Nauk SSSR, Ikhtiologicheskaya Komissiya, Moscow, U. S. S. R.

"Where Do Seven Islands Cod Come From?" by Yves Jean, article, Trade News, vol. 16, no. 2, August 1963, pp. 6-7, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

CRABBING:

"Zinc Anodes Save Money for Commercial Crabbers," article, Fish Boat, vol. 8, March 1963, p. 13, printed. H. L. Peace Publications, 624 Gravier St., New Orleans 9, La.

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Influence of Hosts on the Behavior of the Commensal Crab, PINNOTHERES MACULATUS Say, by A. N. Sastry and R. Winston Menzel, Contribution No. 181, 8 pp., printed. (Reprinted from Biological Bulletin, vol. 123, no. 2, October 1962, pp. 388-395.) Oceanographic Institute, Florida State University, Tallahassee, Fla.

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Afloramiento y Corrientes Cercanas a Cuba (Upwelling and Currents Near Cuba), by Juan J. Tapanes, Contribution No. 17, 28 pp., illus., printed in Spanish, July 1963. Centro de Investigaciones Pesqueras, Departamento de Pesca, Playa Habana, Bauta, Cuba.

DAHOMEY:

Investment Law in the Republic of Dahomey, OBR 63-104, 12 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., August 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The Investment Code of the Republic of Dahomey was enacted by the National Assembly on December 31, 1961, as part of the Dahomean Government's program to encourage foreign private investment. The Code guarantees basic rights to all private investors and provides preferential benefits for undertakings contributing to the country's national development. The report presents a summary of provisions of the code and the complete text of the code covering establishment of an investment code, system of ordinary law, systems of preferential treatment, instructions for submitting applications for approval under the investment code, regulations governing foreign investment in the Franc Area; and information to be furnished in support of an application for approval of investment in Dahomey.

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"The Influence of Dehydration of Foods on the Digestibility and the Biological Value of the Protein,"

by A. P. De Groot, article, Food Technology, vol. 17, March 1963, pp. 103-107, printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

"Instant Fish-Potato Flakes," by J. J. Quigley and L. E. Deveau, article, Trade News, vol. 16, no. 3, September 1963, pp. 8-9, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. A process for producing instant fish-potato flakes, which should prove a real boon for the busy homemaker and restaurant owner is now being tested and improved by the Canadian Department of Fisheries at its Fish Processing Experimental Plant located at Valleyfield on Newfoundland's north-east coast. The process involves the dehydration of a mixture of cooked fish and cooked potatoes on an external type drum dryer. The final product consists of snowy white, fine, dry flakes, each flake containing fish and potato. The flakes may be used for preparing fishcakes, croquettes, fish soup, chowder, or casseroles.

DIRECTORIES:

Directory of the Public Aquaria of the World, by Spencer Tinker and Marian Omura, 37 pp., printed, 1963. Waikiki Aquarium, Honolulu, Hawaii.

DRUM:

"A Study of Redfish, Sciaenops ocellata (Linnaeus) and Black Drum, Pogonias cromis (Linnaeus)," by Ernest G. Simmons and Joseph P. Breuer, article, Publications of the Institute of Marine Science, vol. 8, 1962, pp. 184-211, printed. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

DRYING:

"Investigations on Dehydration of Some Commercial Fish in India," by P. V. Prabhu and others, article, Current Affairs Bulletin, no. 37, August 1963, pp. 1-12, illus., printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

EL SALVADOR:

Foreign Trade Regulations of El Salvador, OBR 63-109, 8 pp., processed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., July 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) Covers trade policy, import tariff system, sales and other internal taxes, and documentation and fees. Also discusses labeling and marking requirements, special customs provisions, nontariff import trade controls, United States controls, and Government representation in the United States. Pending ratification of the San Jose Protocol (Signed July 1962) to the Central American Convention on the Equalization of Import charges, preferential import duty rates are applicable to unpacked cod, edible fish eggs and sardines.

EUROPEAN COMMON MARKET:

"Une Nouvelle Reunion de Hauts Fonctionnaires des Peches du Marche Commun s'Est Tenue a Bruxelles le 6 Septembre" (A New Meeting of High Officials in the Fisheries of the Common Market is Held in Brussels on September 6), article, La Pêche Maritime, vol. 42, no. 1026, September 1963, p. 571, printed in

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French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190, Boulevard Haussmann, Paris, France.

FACTORYSHIPS:

"BMV Delivery of Shrimp Factory Ship to Pakistan," article, Norwegian Fishing and Maritime News, vol. 9, no. 4, 1962, p. 11, printed. Norwegian Fishing and Maritime News, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

"The Development of Factory Ships and of Related Media in Ocean Fisheries, III," by Onar Onarheim, article, Norwegian Fishing and Maritime News, vol. 10, no. 3, 1963, pp. 31, 33, 35, printed. Norwegian Fishing and Maritime News, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

FARM PONDS:

"Standing Crops of Fish in Oregon Farm Ponds," by Gary W. Isaac and Carl E. Bond, article, Transactions of the American Fisheries Society, vol. 92, no. 1, 1963, pp. 25-29, printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

FIRST AID:

The Ship's Medicine Chest and First Aid at Sea, 498 pp., illus., printed, revised 1955. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Includes chapters on the structure and functions of the human body, hygiene, general nursing care, first aid, and the classification and treatment of diseases. Provides instructions beyond first aid, as continued treatment and after care may be necessary until the services of a physician become available.

FISH BEHAVIOR:

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"Maksimal'nye Skorosti Dvizheniya Ryb." (The Maximum Speeds of Movement of Fishes), by V. N. Chestnoi, article, Rybnoe Khoziaistvo, vol. 9, 1961, pp. 22-27, printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

FISH CULTURE:

The Susquehanna Fishery Study, 1957-1960; a Report of a Study on the Desirability and Feasibility of Passing Fish at Conowingo Dam, Contribution No. 169, 81 pp., printed, 1961. Department of Research and Education, Solomons, Md.

FISH HANDLING:

Handling Sea-Frozen Fish, by A. Banks, Torry Advisory Note No. 2, 8 pp., printed. Torry Research Station, Aberdeen, Scotland.

Take Care of Your Catch, Torry Advisory Note No. 4, 3 pp., printed, 1962. Torry Research Station, Aberdeen, Scotland.

FISHING VESSEL STABILITY:

The following papers were presented before the Food and Agriculture Organization Fishing Vessel Stability Meeting, Gdansk, Poland, October 7-14, 1963. A limited number of copies are available free from the Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Systematic Stability Investigations of Danish Fishing Vessels, by Poul Fribert and Leo Retvig, Paper No. 3, 18 pp., illus., processed.

The Sizing and Rating of the Stability Criteria of Fishing Vessels in the GDR, by G. Mitschka, Paper No. 6, 11 pp., processed.

Stability of Icelandic Fishing Vessels, by Hjalmar R. Bardarson, Paper No. 7, 18 pp., illus., processed.

Casualty and Stability of Japanese Fishing Vessels, by Atsushi Takagi, Paper No. 8, 11 pp., illus., processed.

Stability Security Measure, by Seitaro Kojima, Paper No. 9, 7 pp., processed.

Center of Gravity and Freeboard of a Ship Observed from a Viewpoint of the Stability Criterion, by Toshio Hishida and Norio Tanaka, Paper No. 10, 19 pp., illus., processed.

Stability Standard for Two-Boat Trawlers and Purse Seiners, by Tsutomu Tsuchiya, Paper No. 11, 9 pp., illus., processed.

A Remarkable Case of Capsizing of a Small Trawler, by J. G. De Wit, Paper No. 12, 4 pp., illus., processed.

Stability of Double-Rig Beam Trawlers, by J. G. De Wit, Paper No. 13, 8 pp., illus., processed.

Polish Experience Concerning the Normalization of Fishing Vessels' Stability, by Olgierd Jablonski, Paper No. 14, 8 pp., processed.

Problems Connected with the Introduction of International Rules for Fishing Vessels' Stability, by Lech Kobylinski, Paper No. 15, 7 pp., processed.

Some Suggestions on Investigations into Fishing Vessels' Stability, by Kazimierz Szponar, Paper No. 16, 2 pp., processed.

Analysis of the Relative Value of the Criteria Regarding the Stability of Fishing Vessels, by Jan Dudziak, Paper No. 17, 16 pp., illus., processed.

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fishery production during 1962, with some comparative data for previous years. The tables are grouped together under the headings (1) production, consumption, and requirement; (2) commercial fishing vessels; (3) fish ponds; (4) foreign trade; and (5) other data. Subdivisions of the tables is made according to gear, species caught, monthly production, and fishing grounds. The appendices include, among other items, information on the fishery districts, fishing grounds used by commercial vessels, and forms used in collecting statistics. Except for the table showing production data since 1950, most of the information covers the five-year period 1958-1962.

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"Research and Shrimp Production," by Lyle S. St. Amant, article, Louisiana Conservationist, vol. 15, nos. 11 and 12, November-December 1963, pp. 6-9, illus., printed. Louisiana Conservationist, Wild. Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La. Recent declines in shrimp production in the northern Gulf of Mexico have resulted in a great impetus in shrimp research by state and federal agencies. During the past 3 years shrimp research in that area has been coordinated and carried out by those agencies at a level which for the first time has made adequate data available in time to apply to each year's production. These data are now being applied annually in the prediction of the shrimp harvest, the setting of seasons, and the general management of the shrimp population. This article attempts to place research in its proper perspective and examines what may be expected from the application of research in the shrimp industry in the near and distant future.

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Environment vs. Management in Small Business Failure, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington, D. C. 20416. Environmental rather than managerial factors were dominant in the termination of 20 of the 37 out-of-business firms studied. Some environmental factors were economic decline of the industry in that area and unavailability of financing. The most noticeable difference between successful and unsuccessful owners lay in their approach to decision making. In general, owner-managers of the out-of-business firms had relied less on outside management and technical help than had owner-managers of the firms that were still active.

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Tax Guide for Small Business, 1964, 144 pp., printed, 40 cents, December 1963. Internal Revenue Service, U. S. Department of the Treasury, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) For use in filing the 1963 income tax returns, excise tax returns, and other returns. It answers the Federal tax questions of corporations, partnerships, and sole proprietorships. Explains in plain layman's language the tax results from buying, starting, operating, and the sale and other disposition of a business. In addition, contains a tax calendar for 1964 which should prove helpful to the businessman throughout the year, since it indicates what he should do and when he should do it in regard to the various Federal taxes. Also has a checklist of special interest for the man just starting in business in that it affords a quick method for determining for what Federal taxes he may be liable.

Trends and Prospects for Affiliated Food Retailers, by Russell L. Childress, 168 pp., printed, \$2. Department of Agricultural Economics, University of Delaware, Newark, Del., 1962.

Will Profit Sharing Help Your Firm?, by B. L. Metzger, Management Aid for Small Manufacturers No. 157, 4 pp., processed, October 1963. Small Business Administration, Washington, D. C. 20416. Small companies are finding that profit sharing, when properly handled, provides incentives which can help to bring about employee teamwork, reduced labor turnover, high productivity, better product quality, and lower costs. These results are achieved because profit sharing programs "share the caring" by giving employees a stake in the company's success. Yet the success of a profit-sharing program is not automatic. It depends on many factors, including the company's profit potential, a plan tailored to the company's needs, and keeping employees interested.

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Thirty-First Annual Report for the Period 1st April, 1959 to 31st March, 1960, 242 pp., printed, 1963. Division of Sea Fisheries, Department of Commerce and Industries, Pretoria, South Africa Republic.

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"Valuation of a Fishery," by James A. Crutchfield, article, Transactions of the Twenty-Seventh North American Wildlife and Natural Resources Conference, pp. 335-347, printed. Wildlife Management Institute, Wire Bldg., Washington 5, D. C., 1962.

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"A New Species of Gonatid Squid from the Northeastern Pacific," by William G. Percy and Gilbert L. Voss, Contribution No. 466, 7 pp., illus., printed. (Reprinted from Proceedings of the Biological Society of Washington, vol. 76, August 2, 1963, pp. 105-112.) University of Miami, Marine Laboratory, Institute of Marine Science, 1 Rickenbacker Causeway, Miami 49, Fla.

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"Science and the Future of World Fisheries," by G. L. Kesteven, article, Fishing News International, vol. 2, no. 3, July-September 1963, pp. 289, 293, 295-296, printed, single copy 6s. 6d. (about 85 U. S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. The author advances the view that stocktaking of fishery resources and fishery industries should be accelerated, and developed under international auspices. He believes that this work should be sponsored and organized by FAO's new resources¹ committee for which membership should be drawn from the existing fishery councils and commissions. The work in this stocktaking should be carried out largely by the councils and commissions which now provide a pattern covering the greater part of the earth's surface and its resources.

LENTEN PROMOTION, FEBRUARY 12-MARCH 29



Halibut Steaks Brazilian.

- | | |
|---|-------------------------|
| 2 pounds halibut steaks or other fish steaks, fresh or frozen | ½ cup melted fat or oil |
| 2 tablespoons instant coffee | 1 teaspoon salt |
| 2 tablespoons lemon juice | 1 teaspoon onion salt |
| | Chopped parsley |

Thaw frozen steaks. Place in a shallow baking dish. Dissolve coffee in lemon juice. Add remaining ingredients except parsley; mix thoroughly. Pour sauce over fish and let stand for 30 minutes, turning once. Remove fish, reserving sauce. Place fish on a well-greased broiler pan and brush with sauce. Broil about 3 inches from source of heat for 4 to 5 minutes. Turn carefully and brush with remaining sauce. Broil 4 to 5 minutes longer or until fish flakes easily when tested with a fork. Garnish with chopped parsley. Serves 6.

Halibut from the Pacific Northwest takes on a Latin flavor subtly complimented with the tangy zip of lemon and the warm freshness of coffee. Easy elegance, combined with already-on-the-shelf ingredients, will make this handy entree a popular favorite at your dinner table.

--From Fisheries Marketing Bulletin: "Protein Treasure from the Seven Seas,"
 Issued by the National Marketing Services Office,
 U. S. Bureau of Commercial Fisheries, Chicago 5, Ill.

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Fishes

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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

G. A. Albano and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, Wyatt Bldg., Suite 611, 777 14th Street, NW., Washington, D. C. 20005.

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5/31/68

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GULF OF ALASKA SCALLOP EXPLORATIONS--1963

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ABSTRACT

Exploratory fishing for scallops (Patinopecten caurinus) was conducted in the waters of the Gulf of Alaska during 1963. The objective of this survey was to determine the practicality of more detailed explorations for scallops in that area. Catches of scallops were made in amounts as high as 7 bushels per 30-minute drag with an 8-foot dredge. The individual scallops ranged up to 7 inches in diameter and yielded approximately 4-6 pounds of shucked meats per bushel measure. Good catches of scallops were taken at several locations including: off Cape Fairweather at depths from 34-42 fathoms, off Icy Bay from 39-44 fathoms, and east of Cape Saint Elias where catches were taken between 54 and 56 fathoms. It is not expected that this potential resource will receive significant exploitation until (1) the range and abundance are better defined and (2) thorough consideration is given to all aspects of the economics including production, processing, and marketing.

INTRODUCTION

Over the past decade various fishery surveys in the Gulf of Alaska have established that a species of large scallop (Patinopecten caurinus) was present in moderate numbers at certain locations. Shellfish investigations were conducted with the U. S. Bureau of Commercial Fisheries vessel John N. Cobb during 1953 in the Yakutat Bay area (Schaefer and Smith 1954). In the course of those explorations, small quantities of scallops were taken with a "New Bedford"-type scallop dredge and a beam trawl. In 1961, a trawl survey over much of the Continental Shelf of the Gulf of Alaska was started under the direction of the International Pacific Halibut Commission. During that survey, moderate quantities of scallops (up to 1,000 per one-hour drag) were taken at various locations between Cape Fairweather and Cape Saint Elias at depths between 30 and 70 fathoms.

Prior to the above, there was no apparent documentation of effort to establish the abundance of the potential scallop resource in the Gulf of Alaska. However, several attempts were made in the Kodiak and Cook Inlet (Seldovia) areas to capture quantities of scallops for local use. An additional source of information was derived from reports by halibut fishermen who related that scallops occasionally clamped on to their gear (long lines) while it was on the bottom.

Surveys were also conducted in the waters adjacent to British Columbia (Quayle 1961, 1963). Those findings did not indicate any potential for a scallop industry off British Columbia.

Occasional catches of scallops were reported by trawl fishermen off the coasts of Washington and Oregon; and Fitch (1953) indicates that they are "frequently taken in considerable numbers by flatfish trawlers operating out of Eureka" (California).

A fishery for a related species Patinopecten yessoensis is carried on in the waters of Hokkaido, northern Japan (Cahn 1951).

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With this background, a modest plan of exploration was developed to determine the practicality of more complete surveys for the (Patinopecten caurinus) scallop in Alaskan waters.

METHODS

The U. S. Bureau of Commercial Fisheries vessel John R. Manning was made available for the work from May 20 to June 14, 1963 (Cruise 63-1). The John R. Manning (fig. 1) is a combination type purse seiner-trawler, 86 feet 6 inches in length. The primary sampling gear employed during the exploratory operations consisted of an 8-foot, New Bedford-type, deep-sea scallop dredge, with a $\frac{1}{2}$ -inch diameter sweep chain supporting the bag of 3-inch diameter rings and $\frac{5}{16}$ -inch connectors. Supplementary equipment included the attachment of



Fig. 1 - The vessel John R. Manning, U. S. Bureau of Commercial Fisheries vessel, used for scallop exploratory cruise during the spring of 1963.

"rock chains" which prevent the passage of large boulders or rocks into the bag of the dredge (figs. 2A and 2B). That equipment was obtained from a manufacturer in Massachusetts. The dredge was fished from the starboard gallows frame. The vessel's trawl winch was used for stowing and retrieving the $\frac{9}{16}$ -inch diameter wire rope used to drag the dredge during the explorations. A ratio of 4:1 was maintained for wire-out-to-depth relationship.

The duration of individual scallop drags varied from 5 to 60 minutes. Most frequently the time elapsed while the dredge was fishing averaged 30 minutes. A detailed description of the gear and its operation is given by Posgay (1957).

Positions were established by direct bearings from landmarks or were made with Loran fixes. Depth and general bottom characteristics were determined with a sensitive electronic depth-recording device. Throughout the cruise fishing speed was maintained at about 2-3 knots.

Measurements of the scallops caught were taken by direct count of bushel samples from catches greater than one bushel. When catches were less than one bushel, the entire catch of



Fig. 2A - Eight-foot scallop dredge similar to the equipment used in the scallop fishery of the Northwest Atlantic. Note the rock chains ahead of the sweep chain.



Fig. 2B - Eight-foot scallop dredge being hoisted over the rail of the John R. Manning with catch of scallops. Note that the rock chains shown in figure 2 have been removed.

individual scallops was counted. At intervals, size-frequency measurements were made of random samples. The measurements recorded provided the diameter of the shell from the hinge to the outer margin of the shell. Scallops were also shucked to determine the number of meats (eyes) per pint measure.

AREA COVERED

The investigation under discussion was conducted in the coastal area of the Gulf of Alaska between Cape Spencer and Cape Saint Elias (fig. 3). Due to the limited period available, principal effort was expended at (or close to) locations at which prior trawling had revealed the presence of scallops. The depths investigated ranged from 22 to 85 fathoms. Most of the dredging, however, occurred between 30 and 60 fathoms. The characteristics of the bottom along that part of the coast are, in general, favorable to dredging. Most of the bottom traversed consisted of sand, mud, or mud and sand, with only occasional patches of gravel, boulders, or rock ledges. Several bays and rivers join with the Gulf of Alaska in that area and a number of very large glaciers are evident.

RESULTS OF EXPLORATIONS

DISTRIBUTION AND ABUNDANCE OF SCALLOPS: Scallops of the same size as those produced in the commercial fishery of the Northwest Atlantic were taken throughout the entire range of the area investigated (fig. 4). Over 70 percent of individual dredge hauls completed produced scallops in amounts up to 7 bushels of scallops per 30 minutes of effort. The best catches were made between 30 and 70 fathoms where the scallops seemed to be concentrated in beds. Locations at which the concentrations of scallops were most promising in-

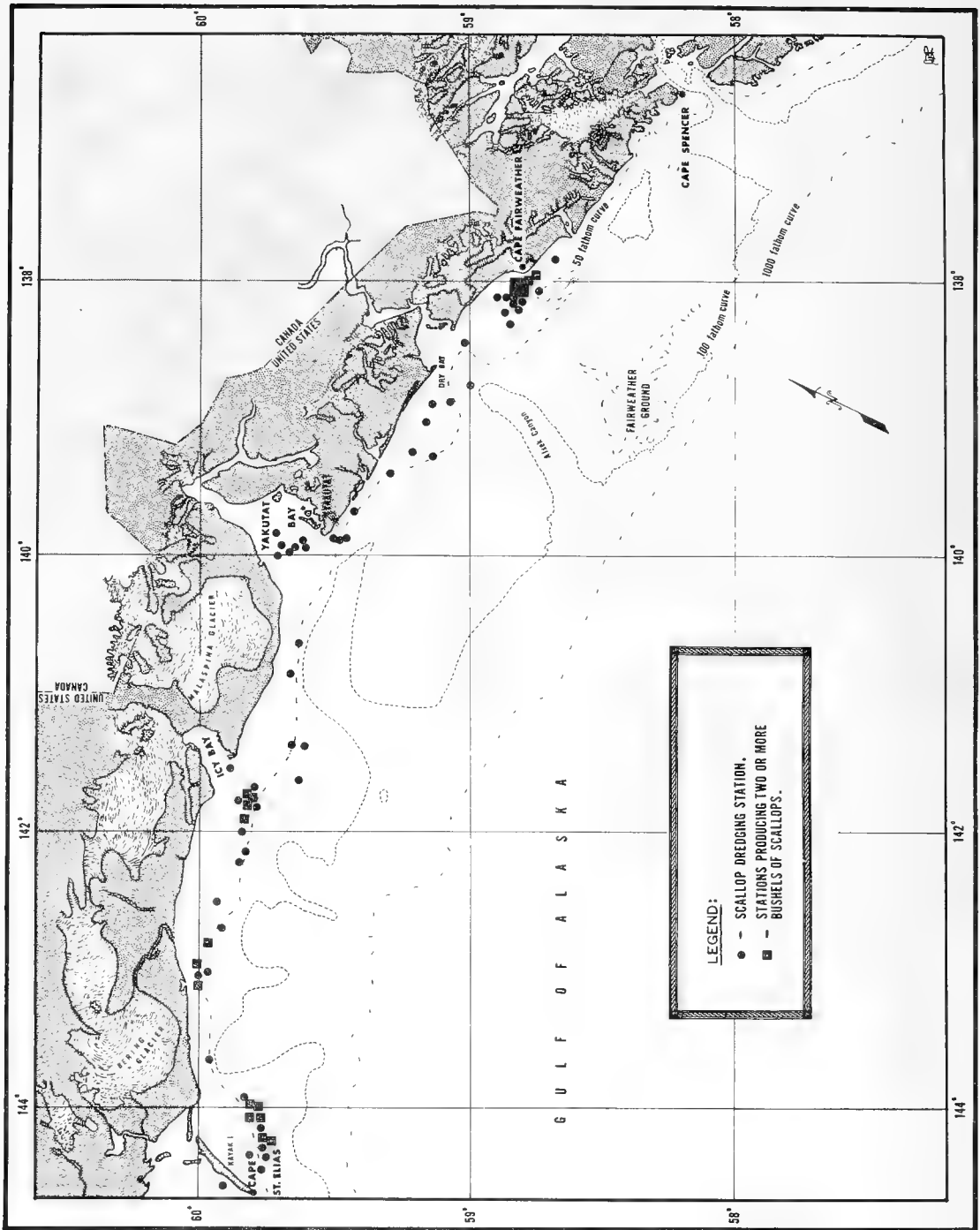


Fig. 3 - Map depicting the area of the Gulf of Alaska where scallop fishing was conducted during the spring of 1963.

cluded: off Cape Fairweather at depths of 34 to 42 fathoms; off Icy Bay in 30 to 44 fathoms; and east of Cape Saint Elias, where the best catches were made between 54 and 56 fathoms.

| Distribution of Scallops (by Depth) Taken During Exploratory Fishing, 1960-63 ^{1/} | | | |
|---|--|--|---------------|
| Depth (in Fathoms) | 9,333 Scallops Collected During Trawl Surveys, 1960-1962 | 11,754 Scallops Collected By the <u>John R. Manning</u> , 1963 | Combined Data |
| Expressed in Percentage of Total | | | |
| 10-20 | Less than 1 | - | Less than 1 |
| 21-30 | Less than 1 | - | Less than 1 |
| 31-40 | 19 | 52 | 37 |
| 41-50 | 27 | 28 | 27 |
| 51-60 | 27 | 14 | 20 |
| 61-70 | 23 | 5 | 13 |
| Over 70 | 3 | 1 | 2 |

^{1/}All records are from area between Middleton Island and Cape Spencer in the Gulf of Alaska.

A total of over 20,000 scallops was taken by exploratory fishing vessels from the north-eastern Gulf of Alaska between 1960 and 1963. The distribution of those captures by depth is summarized in table. The sampling by the John R. Manning during 1963 was primarily at depths and locations expected to be the favorable habitat for scallops as indicated by the records of earlier explorations. Catch rates of scallops ranged from 0 to 7 bushels per 30-minute drag. As the time available for explorations was limited, no production fishing was attempted. The explorations indicate a widespread distribution of the resource throughout the area surveyed.

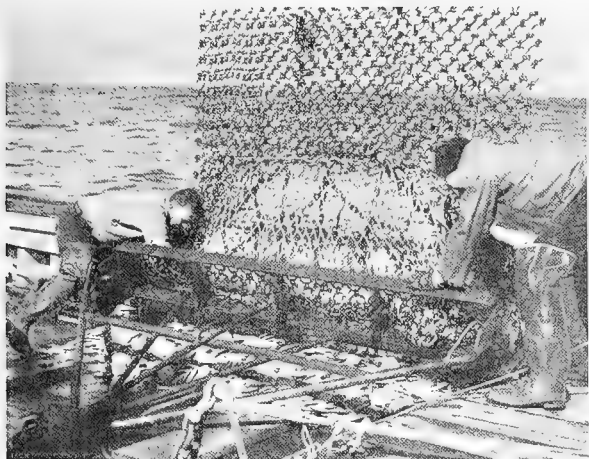


Fig. 4 - Catch of scallops from the Gulf of Alaska being dumped on the deck of the John R. Manning.



Fig. 5 - A catch of large scallops taken from the waters near Cape Saint Elias in the Gulf of Alaska.

SIZE AND YIELD OF SCALLOPS: The scallops captured during individual drags were frequently similar in over-all size, indicating a tendency toward natural segregation by sizes. A tendency toward larger average sizes was noted as sampling progressed westward from Cape Fairweather toward Cape Saint Elias. East of Yakutat Bay, the size of scallops measured ranged from $2\frac{3}{4}$ to $6\frac{1}{2}$ inches (measured from the hinge to the outer margin of the shell). Of those, 73 percent were between 3 and 4 inches. West of Yakutat Bay, the size range was from 3 to 7 inches, with 82 percent of the scallops falling between 5 and $6\frac{1}{2}$ inches (fig. 5). The number of scallops per bushel measure ranged from about 240 per bushel at the 3- to 4-inch sizes to approximately 60 per bushel for the 6- to 7-inch sizes.



Fig. 6 - Crewman shucking scallop meats from the shell. The yield of meats varied from approximately 4 to 6 pints per bushel of whole (shell stock) scallops.



Fig. 7 - Representative size of scallops taken during explorations. Over eighty percent of the scallops were over 4 inches, when measured from the hinge to the margin of the shell.

The yield of shucked meats per bushel measure of scallops varied from 4 to 6 pints (fig. 6). The size of meats, however, varied from 15 to 60 count per pint measure.

The over-all quality of the meats was excellent and comparable in size, appearance, texture, and taste to scallops now on the market (fig. 7). Some meats from the large scallops were slightly yellow in color and had been taken from a bottom of fine green mud.

COMMERCIAL POTENTIAL

Since 1960, the commercial production of sea scallops from United States ports has averaged over 25 million pounds of meats per year. During the last 10 years production of scallops by Canadian (east coast) fishermen has increased from less than 2 million to over 10 million pounds a year. A comparison of catch rates and scallop sizes between the existing (Georges Bank) fishery and the Gulf of Alaska exploratory results reveals some cause for speculation. The maximum catch rates of 5 to 7 bushels per 30-minute drag experienced in the Gulf of Alaska stand up well to catch rates for a similar unit of effort by New England fishermen on the Georges Bank grounds (fig. 8). It is not possible to predict with any certainty the relative density of the Gulf of Alaska stocks as compared with those on Georges Bank.

The size and yield, however, is directly comparable. The average yield per gallon of meats in the Atlantic fishery is just under 200 per gallon and the approximate yield



Fig. 8 - Scallop catch aboard John R. Manning being measured in bushel baskets. Up to 7 bushels of scallops were taken during individual 30-minute drags with an 8-foot scallop dredge.

range for scallops caught by exploratory fishing in the Gulf of Alaska is 120 to 500 meats per gallon.

Alaska fisheries developments over the past 10 years have demonstrated good gains in production. Other shellfish products, king and dungeness crab, as well as shrimp, are good examples of fisheries with substantial increases.

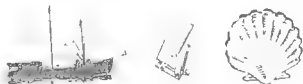
Among the less encouraging features of the available information are the following:

1. Inadequate definition of the Gulf of Alaska scallop stocks.
2. Lack of vessels and fishermen with background suitable to enter into the fishery.
3. High labor input required to shuck scallops.
4. High operating and transportation costs.
5. No established processing and marketing chain.

In conclusion, the possible commercial utilization of recently discovered beds of scallops in the Gulf of Alaska will depend on more detailed information on abundance of the stocks along with several economic considerations.

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Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.



TRENDS AND DEVELOPMENTS

Alaska

FOREIGN FISHING OFF ALASKA, NOVEMBER-DECEMBER 1963:

The withdrawal of foreign fishing vessels from the waters off Alaska continued during November 1963 and by month's end less than 20 vessels remained of the more than 400 Soviet and Japanese craft operating in mid-summer 1963. A single shrimp-processing vessel and 14 accompanying trawlers constituted the entire Japanese fishing effort in that area in November. This fleet operated in the region north and west of the Pribilof Islands during most of the month. The Japanese planned to operate this shrimp fleet intermittently throughout the 1963/64 winter. Soviet fishing efforts were entirely withdrawn in November from the eastern Bering Sea and Gulf of Alaska. It was expected that the Soviet trawl fisheries will resume in the eastern Bering Sea when the ice pack advances into the trawling areas and can be used as shelter for the fishing vessels.

After an absence of Soviet fishing activities in November, the anticipated movement of Soviet winter trawling fleets into the eastern Bering Sea began in mid-December. Japanese activities remained at a low level. Soviet trawlers and associated support vessels began departing their Siberian ports in early December and by month's end about 60 vessels were concentrated in an area roughly 100 miles northwest of St. Paul Island. Those fleets were reportedly obtaining excellent trawl catches of herring and flatfish in the shallower waters adjacent to the 100-fathom curve. Soviet trawling efforts were expected to continue to increase during January 1964, expanding into areas south and east of the Pribilof Islands. The Japanese shrimp factoryship Chichibu Maru and her accompanying trawlers remained the sole Japanese fishing fleet near Alaska from November through December. This fleet has generally operated north and west of the Pribilof Islands but in December

started to shift to waters along the 100-fathom curve south and east of the Pribilofs.

* * * * *

FISHERY VENTURES IN JUNEAU AREA:

A newly developed corporation started operations at a cannery site in Juneau during the latter part of 1963. Up to ten vessels may be used for producing "fresh" shellfish products. It was reported that initial emphasis is to be devoted to shrimp and crab processing with some consideration given to scallop resources investigated by the U. S. Bureau of Commercial Fisheries in the spring of 1963. The area of fishing operations being considered is from lower Chatham Straits to Yakutat.

* * * * *

KODIAK COLD-STORAGE PLANT PROCESSING DUNGENESS CRAB:

A cold-storage plant in Kodiak began processing Dungeness crab in October 1963 for shipment to various parts of the United States as fresh ocean crab. As of November, five vessels were engaged in this new industry. (Kodiak Mirror, November 8, 1963.)

* * * * *

WINTER FISHERY FOR BAIT HERRING BEGINS NEAR KETCHIKAN:

The first 1963/64 winter season delivery of bait herring to a fishery company in Ketchikan was made in December by the purse seiner Lady Alice. A good catch of 250 barrels was made in Tongass Narrows within a mile of the firm's dock which indicated the reappearance of herring in the local area after several years of relative scarcity. The winter bait fishery at Ketchikan normally accounts for 1.5 million to 2.0 million pounds of herring and provides a limited winter fishery for a few local seiners.

* * * * *

SECOND CONFERENCE ON TECHNOLOGY OF KING CRAB PROCESSING:

Plans for the Second Conference on the Technology of King Crab Processing were announced by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Ketchikan. It was anticipated the meeting will be held in either Ketchikan or Anchorage during the first week in May 1964.

* * * * *

CRAB TAG RECOVERIES REDUCED BY HEAVY WINDS:

Only 30 tags from king crabs were returned by Alaska fishermen during December. It was the lowest monthly return of tags since the current fishing season started. The highest return was over 200 tags sent to the U.S. Bureau of Commercial Fisheries Auke Bay Biological Laboratory in November. The sharp drop largely reflected the effects of the severe storms in December that restricted the fishing fleet, although there is usually some decline over the holiday season.

* * * * *

SUCCESS OF PINK SALMON EGG DEPOSITION VARIES IN SASHIN CREEK:

At the Little Port Walter Station, pink salmon eggs successfully deposited in lower Sashin Creek were only 37 percent of those available compared to 78-percent success in the upper reaches, although the numbers of female pink salmon per square yard of spawning gravel were about the same. The possibility is being studied that the difference in spawning success was due to a difference in the composition of bottom materials resulting from stream gradient. Lower Sashin Creek has a gradient of 0.1 percent while the upper spawning areas have a gradient of 0.7 percent.

* * * * *

RAIL-BARGE SERVICES EXPANDING:

In April 1963, a barge service between Prince Rupert, British Columbia, and Saxman (near Ketchikan), Alaska, opened all-rail traffic between Alaska and the lower 48 States. The terminal at Saxman has truck and ferry connections to all cities in Southeastern Alaska. During 1963, about 60 mechanically-refrigerated carloads of fish moved south over the Saxman-Prince Rupert facility to various United States receiving stations. Destinations included Miami, Fla., Cincinnati, Ohio, Louisville, Ky., Pittsburgh, Pa., and Baltimore, Md.

Rail-barge connections to Alaska are being expanded. Other barge services now provide all-rail capability between Whittier (Anchorage area), Alaska, and the Puget Sound area of Washington State as well as between Whittier, Alaska, and Prince Rupert, B.C. In addition, similar service may be established between Puget Sound and Saxman and between Vancouver, B.C., and Whittier.



American Fisheries Advisory Committee

FISHERIES PROBLEMS DISCUSSED AT ANNUAL MEETING:

A number of critical issues confronting the United States fishing industry at domestic and international levels were considered at the 17th annual meeting of the American Fisheries Advisory Committee held January 22-25, 1964, at Honolulu, Hawaii.

Special emphasis was placed on the fishery resources of Hawaii and the Central Pacific Ocean. During the four-day meeting, the Committee heard discussions of Central Pacific fisheries by officials of the State of Hawaii, Government of Guam, and the Government of American Samoa. In addition, key biological and oceanographic programs were described by staff members of the U.S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu. It was stressed that this research will benefit all segments of the United States fishing industry in the Pacific and elsewhere. The Bureau's plans to aid the local fishing industry were strongly endorsed by the Committee. Other matters considered during the meeting included: (1) Atlantic tuna; (2) expansion of fishery trade; (3) fishing vessel construction legislation now pending before Congress; and (4) territorial fishing rights. The Committee also had an opportunity to tour the Bureau's research facilities at Kewalo Basin and the University of Hawaii campus, as well as tuna canning operations at a local cannery.

At the conclusion of Executive Sessions held on the last day of the meeting, the Committee urged that the United States increase its status as a high-seas world fishing nation by taking the following steps:

1. The tuna fisheries are becoming more international in nature and world tuna consumption is increasing. The United States must make every effort to increase its catch of tuna, and cooperation between government and industry is essential to achieve this goal. More modern, long-range vessels may be required to carry out a successful program of high-seas fishery expansion.
2. Steps should be taken to encourage young workers to seek employment in the fishing industry through training programs, and through modernization and mechanization of vessels and processing plants.
3. Passage of fishing vessel construction legislation is necessary for the modernization of United States fishing fleets, to provide a better environment for successfully competing with foreign nations.
4. The export of United States fishery products to all world markets is essential and can be accomplished through use of counterpart funds (foreign funds held abroad), and the Food for Peace Program.
5. The Bureau of Commercial Fisheries must actively continue its search for new products such as fish protein concentrate (fish flour) as a means of developing wider use for unused fishery resources. The expansion of the industry is greatly limited by the inability to properly utilize its catches.

6. The Bureau program to study effects of pesticides on fisheries resources should be continued to protect the public and the fishery resources of the nation.

Following adjournment of the meeting on Saturday, January 25, the Committee participated in commissioning ceremonies for the new oceanographic research vessel Townsend Cromwell, which will be operated by the Honolulu Biological Laboratory of the Bureau of Commercial Fisheries.

The American Fisheries Advisory Committee, which is composed of 20 fishing industry representatives from various parts of the United States, was organized under the Saltonstall-Kennedy Act of 1954. The Committee, which is responsible for advising the Secretary of the Interior on general fisheries matters, has held 16 previous meetings in other areas of the United States. The 17th meeting was the first to be held in Hawaii.



California

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 63-A-7 (October 6-23, 1963) and Cruise 63-A-8 (November 4-22, 1963): The main objectives of these cruises

by the California Department of Fish and Game research vessel Alaska were to: (1) measure the density, distribution, and age composition of inshore pelagic fish species; (2) measure the success of 1963 sardine spawning; and (3) collect juvenile sardines for growth studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory at La Jolla, Calif.

Cruise 63-A-7 was carried out off the Mexican coastal waters of northern Baja California from Sacramento Reef to the International Border.

Cruise 63-A-8 was conducted off southern California from the International Border to Gaviota.

Sampling was accomplished chiefly by towing a large midwater trawl for 40 minutes at each station. The net was fished at night within 10 fathoms of the surface. Night-light, blanket-net stations were used as a secondary sampling technique. On the northern Baja California cruise, 26 trawl and 29 night-light stations were occupied; during the southern

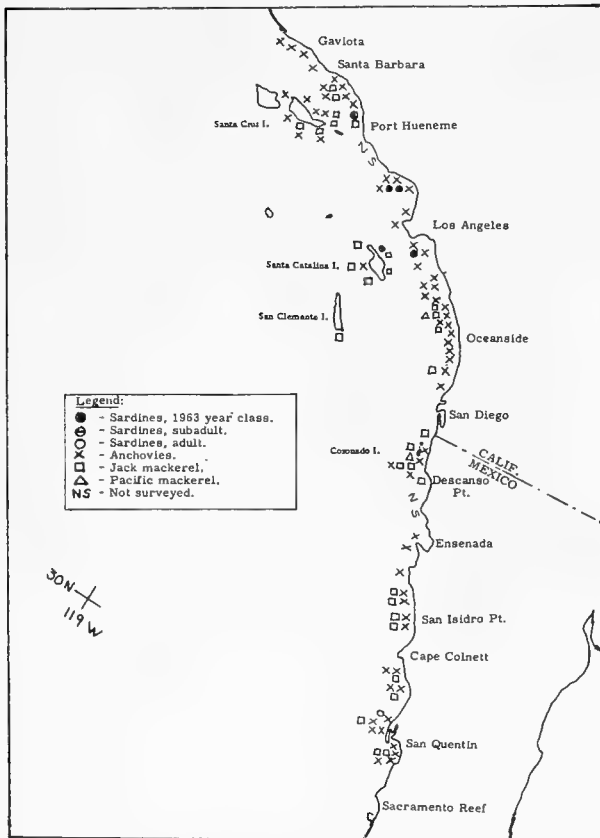


Fig. 1 - Midwater-trawl catches during M/V Alaska Cruise 63-A-7 (October 6-23, 1963) and Cruise 63-A-8 (November 4-22, 1963).

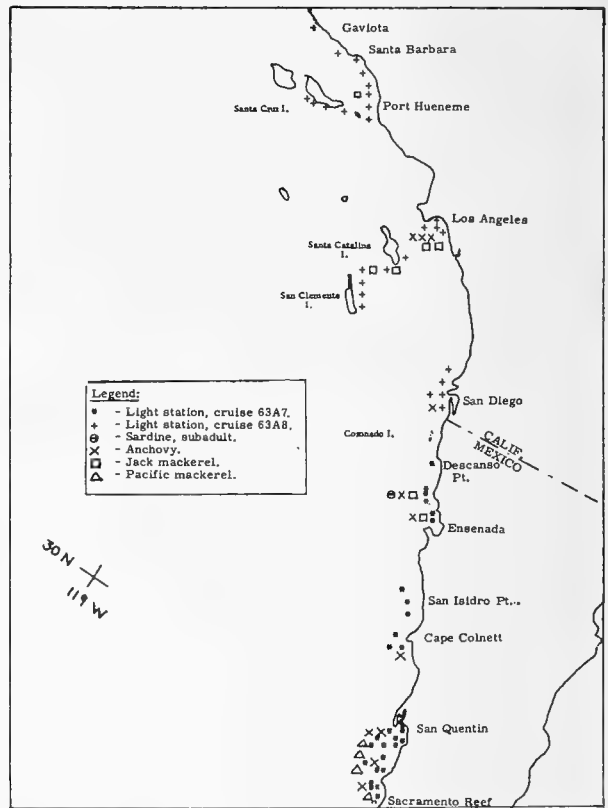


Fig. 2 - Night-light catches and night-light stations sampled during M/V Alaska Cruise 63-A-7 (October 6-23, 1963) and Cruise 63-A-8 (November 4-22, 1963).

California cruise, 50 trawl and 27 night-light stations were occupied.

Schools of fish sighted while en route between stations were identified and counted. Visual night scouting covered 142 miles off Mexico and 212 miles off California.

ANCHOVIES: Northern anchovies (Engraulis mordax) far exceeded all other species both in number caught and in number of samples taken. Midwater-trawling in northern Baja California caught anchovies at 88 percent of the stations, in amounts varying from 3 to 22,500 fish per tow. However, over three-fourths of those catches consisted of fewer than 4,000 fish, and a majority amounted to less than 500. Anchovies were taken along the entire route of the Mexican cruise, except in a small area south of Descanso Point, Baja California. Juveniles (75-90 millimeters) were predominant from Sacramento Reef to Cape Colnett, Baja California, while adults, averaging close to 130 millimeters were found from San Isidro Point to the International Border. No dense schools or concentrations were observed and only 13 small schools were sighted. Echo soundings made during trawl tows indicated a continuous scatter of fish.

Anchovies also dominated the night-light catches in northern Baja California, but catches were not as widespread or as numerous as with the trawl. (Anchovies were taken at 24 percent of the light stations.) The size of anchovies taken during night-light fishing was similar to those caught by trawling.

The size and frequency of anchovy catches off southern California were very similar to those off northern Baja California. Off southern California anchovy were caught in 84 percent of the total trawl tows, and in all but 1 inshore tow (within 10 miles of the coast). Catches ranged from 1 to 600,000 fish with most containing fewer than 500. Juveniles (75-90 millimeters) completely dominated the catch over most of the area. Pure catches of adults were made only in the Santa Cruz Island and Santa Barbara areas. As in northern Baja California, very few schools and no concentrations were observed in spite of excellent scouting conditions. During 212 miles of night scouting, only 8 small schools were seen. Extensive echo soundings failed to detect a single concentrated school, but indicated extensive areas of dispersed fish.

Night-light fishing off southern California yielded anchovies at only 4 of 27 stations, and

negative results were obtained in areas that produced good trawl catches. The size and frequency of midwater-trawl catches and the absence of concentrated schools indicated an extensive, scattered anchovy distribution.

JACK MACKEREL: Jack mackerel (Trachurus symmetricus) ranked second in both trawl and night-light catches, with juveniles (45-200 millimeters) comprising almost the entire catch. Jack mackerel appeared in 54 percent of the trawl and 8 percent of the light station catches in northern Baja California. Trawl catches ranged from 7 to 2,050 fish, although only 3 tows caught over 100. The best catches off Mexico were made from Descanso Point to the Coronado Islands.

In southern California waters, jack mackerel were caught at 34 percent of the midwater-trawl stations and at 22 percent of the night-light stations. The best catches were made at San Clemente and Santa Catalina Islands, where up to 75 fish were taken per haul.

SARDINES: Sardines (Sardinops caeruleus) were scarce over the entire area surveyed. One sample was taken by night light and 1 by trawl in northern Baja California; 5 were taken by trawl in southern California. No schools were seen during night scouting. The 7 catches consisted of 3 samples of the 1963 year-class, 2 of subadults, and 2 of adults.

All of the 1963 year-class sardines were taken off southern California. They were mixed with large numbers of anchovies. The largest catch was 22 sardines in a tow containing 6,000 anchovies. Although the southern California sardine catches contained only a few fish-of-the-year, this was an improvement over the 1961 and 1962 surveys, which located no fish-of-the-year in that area. Unseasonal late summer spawning was indicated by the small fish sizes (47-70 millimeters) in 2 samples. Small sardines were not taken in sufficient numbers for the U. S. Bureau of Commercial Fisheries age and growth study.

PACIFIC MACKEREL: Pacific mackerel (Scomber diego) were not sampled in quantity although they apparently were present in both northern Baja California and southern California waters. Large schools were seen over a wide area from San Quentin to Cape Colnett, Baja California, during daylight hours, and the California commercial fleet caught 2,000 tons in southern California while the survey

was in progress. Midwater-trawl catches consisted of only 1 small sample of juvenile fish on each of the 2 cruises. Night-light stations yielded 4 samples in northern Baja California and none in southern California. It appears that both midwater-trawl and night-light fishing are ineffective in adequately sampling adult mackerel.

MISCELLANEOUS OBSERVATIONS: Off southern California, bonito (*Sarda chiliensis*) were the species most commonly sighted during night scouting. They were taken in 20 percent of the trawls, and 27 schools were sighted. Salps (*Salpa tilesii-costata*) were frequently taken on both cruises, and sometimes caused considerable clogging of the trawl while fishing off southern California. Squid (*Loligo opalescens*) and pyrosomes (*Pyrosoma* sp.) were occasionally taken in small quantities.

The trawl again proved its superiority in sampling anchovies. Anchovies were caught at 86 percent of the trawl stations but at only 20 percent of the night-light stations. The light failed to attract anchovies many times in areas where consistent trawl catches were made. Jack mackerel and sardines were taken by both types of gear, but the trawl appears to be the more efficient, especially when those species are scarce. Adult Pacific mackerel were sampled more efficiently by the night light (adults were not caught in the trawl in spite of good indications that they were present).

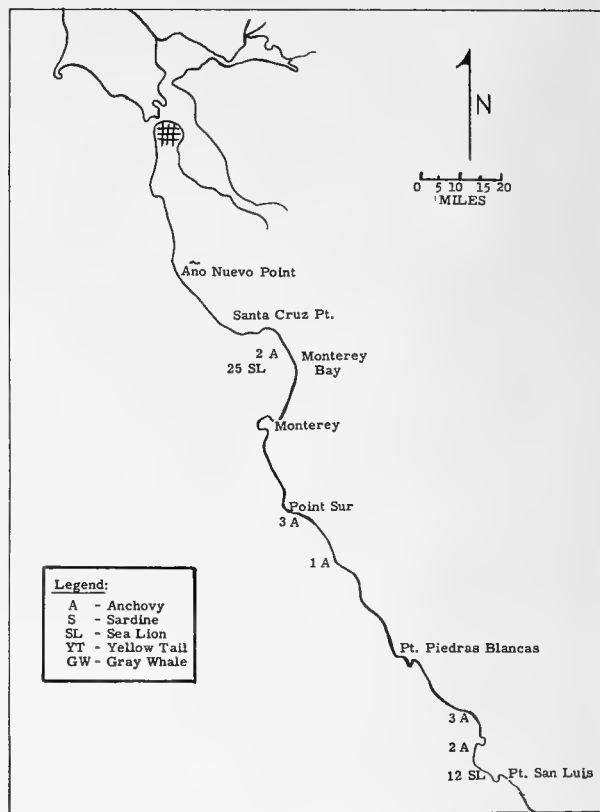
Weather conditions on both cruises were generally favorable. Several mechanical breakdowns on the northern Baja California cruise limited scheduled work. A newly-constructed device for recording trawl fishing depths was successfully tested on the southern California cruise.

Note: See Commercial Fisheries Review, December 1963 p. 17.

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Airplane Spotting Flight 63-12-Pelagic Fish (December 16-17, 1963): The survey to determine the inshore distribution and abundance of pelagic fish schools was continued by the California Department of Fish and Game Cessna "182" 9042T during flights over the inshore area from Año Nuevo Point to the United States-Mexican Border.

On December 16, light haze prevailed throughout the area covered from Año Nuevo Point to Ventura, Calif. A total of 11 north-



Pelagic fish survey flight 63-12.

ern anchovy (*Engraulis mordax*) schools were noted at scattered localities north of Point Conception. The two largest schools were in Monterey Bay and were being preyed upon by sea birds. On the first day 37 sea lions were counted--25 in Monterey Bay and 12 off Point San Luis.

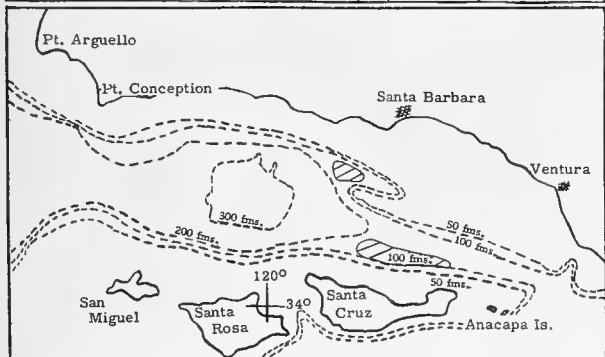
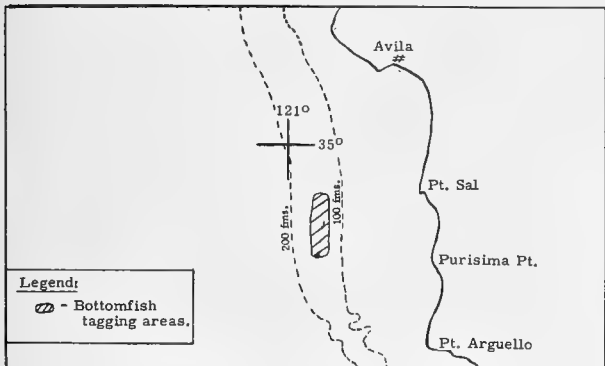
The area from Ventura to the United States-Mexican Border was scouted on December 17. The waters from Sunset Beach to Dana Point were completely obscured by a dense, low fog bank. Light haze persisted in the remainder of the area. A total of 87 anchovy schools, 1 gray whale, 6 small Pacific sardine (*Sardinops caeruleus*) schools, and from 8 to 12 California yellowtail (*Seriola dorsalis*) were sighted. The largest concentration of anchovies was a group of 58 schools extending southward from San Clemente City for about 5 miles. Off Point La Jolla six "tightly-balled" schools of sardines were being "worked" by sea birds, sea lions, and yellowtail. Several party boats were fishing in that area.

Note: See Commercial Fisheries Review, February 1964 p. 12.

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BOTTOMFISH STUDY IN SOUTHERN COASTAL WATERS:

M/V "Alaska" Cruise 63-A-9 (December 3-20, 1963): The main objectives of this cruise in southern California coastal waters by the California Department of Fish and Game research vessel Alaska were to: (1) locate and tag petrale sole (*Eopsetta jordani*) and English sole (*Parophrys vetulus*) for growth and migration studies; and (2) collect greenspotted rockfish (*Sebastes chlorostictus*) and pink rockfish (*S. eos*) for taxonomic studies.



Fishing areas of M/V Alaska during Cruise 63-A-9.

POINT SAL TO POINT ARGUELLO: Twenty-nine tows were made in depths of 120 to 150 fathoms in this area. From those tows, 184 petrale sole and 2 English sole were tagged.

SANTA BARBARA CHANNEL: Two days were spent collecting greenspotted and pink rockfish by hook-and-line and long-line gear in 50 to 160 fathoms near Anacapa Island.

Nineteen otter-trawl tows were made in 50 to 260 fathoms. The tows produced 113 English sole and 4 petrale sole for tagging.

Cephalopods, shells, and unusual fish were collected for special studies.

* * * * *

DUNGENESS CRAB SURVEY IN NORTHERN COASTAL WATERS:

M/V "N.B. Scofield" Cruise 63-S-8 (November 10-December 9, 1963): The objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield in coastal waters between Point Arena, Calif., and Cape Ferrello, Oreg., were to: (1) survey dungeness crab (*Cancer magister*) stocks off northern California to determine abundance, distribution, sex ratios, and condition; and (2) obtain information for crab life-history studies.

OPERATIONS: Ten commercial crab traps were fished overnight at 90 randomly selected stations in productive crab areas between Usal, Calif., and Cape Ferrello, Oreg. Crab shoulder widths were recorded for the entire catch. Shell condition determinations were made for all males of legal size (7 inches or more in breadth).

Ocean shrimp (*Pandalus jordani*) were taken with a 41-foot head rope Gulf of Mexico otter trawl for abundance studies.

RESULTS: Of the 900 crab traps set, 5 were lost. The crab catch in the remaining 895 traps consisted of 2,142 legal-size males, 6,127 sublegal males, and 510 females. The average catch of legal and sublegal males were 2.4 and 6.8 per trap, respectively. The most productive area was between False Cape and Mad River where at 29 stations the average trap catch of legal males was 4.2 crabs. The best station catch occurred off Usal where 14.5 legal-size crabs per trap were taken.

Crabs of legal size were in good condition as only 77 (3.6 percent) were soft. The mean shoulder width of legal-size males was 166 millimeters.

The forecast for the 1963/64 northern California crab season, based on those results, is for a catch between 1.2 and 1.8 million pounds with 1.5 million as the most likely poundage. This is above the northern California crab catch in 1962/63, but far below the long-term average.

Mating activity, as evidenced by mating marks, was noted for those males at 114 millimeter shoulder width and larger. Those crabs had not undergone a recent molt. Three percent of the legal males and 11.5 percent of the sublegal males had mating marks.

Of the 510 females, 265 (52 percent) had eggs in early and intermediate stages of develop-

ment. Twenty-five live egg-bearing female crabs were retained for fertility and fecundity studies.

Note: See Commercial Fisheries Review, Oct. 1963 p. 16. and March 1963 p. 20.

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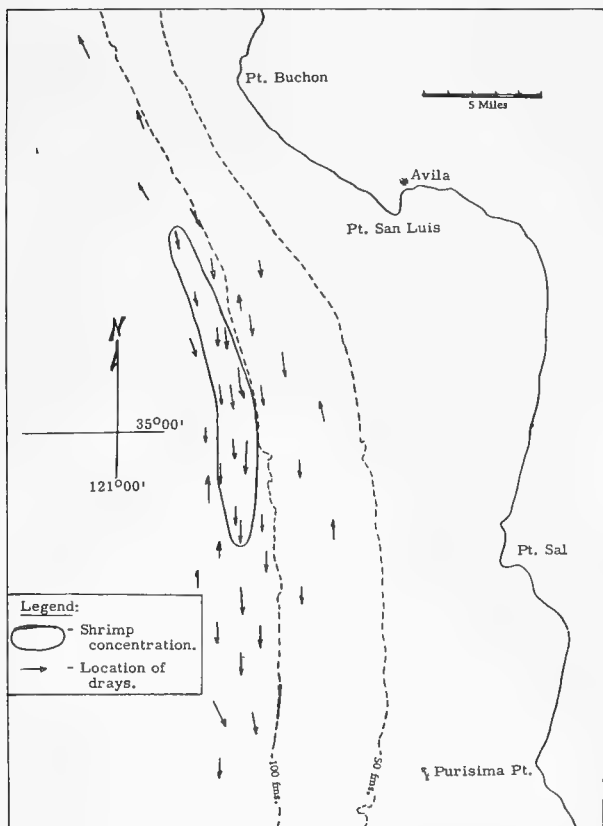
SHRIMP DISTRIBUTION SURVEY CONTINUED:

M/V "N. B. Scofield" Cruise 63-S-9 (December 12-20, 1963): The main objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield off southern California were to:

(1) Locate concentrations of pink shrimp (Pandalus jordani), to determine population estimates and natural mortality rates;

(2) Determine size, sex, and weight of shrimp;

(3) Make bathythermograph and Nansen bottle casts to obtain bottom temperatures and water samples in both producing and non-producing shrimp areas;



Fishing area of M/V N. B. Scofield during Cruise 63-S-9.

(4) Count and weigh species of incidentally caught fish; and

(5) Save all cephalopods, rare fish, and invertebrates for the California State Fisheries Laboratory at Terminal Island.

Off southern California between Purissima Point and Point Buchon, forty 20-minute tows were made with a 41-foot head rope, Gulf of Mexico otter trawl (1¼ inch mesh) in 60 to 159 fathoms. Shrimp were not caught in commercial quantities at any station. The best catch was 62 pounds taken in a 20-minute tow southwest of Point San Luis in 112 fathoms. Catches ranging from 15 to 186 pounds-per-hour (with an average of 47 pounds-per-hour) were made from west of Point Sal to west of Point San Luis in 142 to 105 fathoms. The best catches were taken in 112-118 fathoms.

Heads-on shrimp counts ranged from 44 to 76 per pound and averaged 62. The age composition was as follows: 1963 class--trace, 1962 class--44 percent, 1961 class--56 percent, and 1960 class--trace. The low showing of shrimp-of-the-year (1963 year-class) was partly due to the time of the survey. The young shrimp were still too small to be effectively captured by the 1¼-inch mesh net used.

Females made up 60 percent of the shrimp catch (on an individual count basis). Twenty-six percent of the female shrimp had roe developing in the head region, 73 percent were carrying eggs on the pleopock, and 1 percent showed no signs of ovary development.

Fish catches were moderate. Rockfish catches consisted mostly of stripetail (Sebastes saxicola) and splitnose (Sebastes diploproa). Flatfish catches were light. The most abundant species were rex sole (Glyptocephalus zachirus) and slender sole (Lyopsetta exilis). Other commonly caught fish were hake (Merluccius productus), sablefish (Anoplopoma fimbria), dogfish (Squalus acanthias), sea poachers (Agonidae), and eelpouts (Zoarcidae).

Bathythermograph casts were taken at 21 stations and bottom water samples for salinity determinations were obtained from 5 stations. Surface temperatures ranged from 13.7° to 14.9° C. (56.6° to 58.8° F.) and averaged 14.1° C. (57.4° F.). Bottom temperatures were obtained from depths ranging from 61 to 137 fathoms. Temperatures ranged

from 7.5° to 11.5° C. (45.5° to 52.7° F.) and averaged 8.7° C. (47.7° F.) at an average depth of 97 fathoms.

Note: See Commercial Fisheries Review, December 1963 p. 21.



Central Pacific Fisheries Investigations

SPEED AND SWIMMING EFFORT OF TUNAS STUDIED:

The swimming speeds of various species of fish have long been a popular subject for speculation among fishermen as well as the object of investigation by naturalists and fishery scientists. The speed at which a fish can move is of obvious interest to the man who is trying to catch it, for he must adapt his fishing gear and strategy accordingly. For the scientist, a knowledge of swimming speeds can contribute importantly to his understanding of the relationships among fish of the same species and of the relation of the species to its prey, its enemies, and its competitors.

In some situations, like that of a salmon passing up a fishway, the investigator's task is comparatively easy, but the problem of timing such highly mobile fishes of the open ocean as the tunas and their relatives presents obvious difficulties. Attempts have been made to measure the time taken by fish to pass a known length of a vessel's side, and the rate at which hooked game fish can strip line from an angler's reel may provide data on possible maximum speeds under quite abnormal conditions. Estimates derived from the distance between points of release and recovery for tagged fish can be only approximate, for it is usually not possible to tell how direct a course the fish may have taken. The figures recorded in the scientific literature vary widely for the same species, and for such impressively streamlined and obviously speedy fishes as the tunas the estimates offered often appear unreasonably high.

Scientists of the U.S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu have recently succeeded, through the use of new observational techniques, in not only getting precise measurements of the swimming speeds of tuna but also relating to swimming effort. Motion pictures were taken (from the underwater viewing ports in the hull of the



The Service's research vessel Charles H. Gilbert.

Bureau's research vessel Charles H. Gilbert) of skipjack and yellowfin tuna attracted to the vessel by chumming with live bait. Projection of the pictures on the screen of a microfilm reader made it possible to plot the paths of individual tuna. The distances traveled by the fish were measured from the plots, and speeds were then calculated from the constant rate at which the camera exposes successive frames of film.

Skipjack tuna were recorded swimming at speeds from 4.5 miles per hour to a maximum of 13.1 miles per hour. Those fish averaged about 22 inches in length and would weigh about 9 pounds, which is a medium size for that species. Yellowfin tuna were photographed at speeds ranging from 4.2 miles per hour to 11.4 miles per hour. They were 20-inch or 5½-pound fish which is considered small for that species as yellowfin tuna grow to a weight of 150 pounds or more.

The motion picture technique made it possible to count the tail beats of individual tuna and relate them to the resulting speed of forward movement. It was found that 3 tail beats per second in the skipjack moved the fish at 4.5 miles per hour, while 11 tail beats per second produced a speed of 9.3 miles per hour. Yellowfin appeared to propel themselves slightly more efficiently, getting 4.2 miles per hour from only 2 beats per second and a fast 11.4 miles per hour from 11 beats. When additional data on this relationship between propulsive movements and resulting speed have been accumulated for other sizes and species of tuna, it will be interesting to compare them in the light of what is known about the body form and behavior of the tunas.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES:

January-August 1963: Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, more fresh and frozen fishery products were purchased in August 1963 by the Defense Subsistence Supply Centers than in the previous month. The increase was 1.8 percent in quantity and 18.8 percent in value.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, August 1963 with Comparisons

| QUANTITY | | | | VALUE | | | |
|--------------------------|-------|-----------|--------|-----------------------|-------|-----------|-------|
| August | | Jan.-Aug. | | August | | Jan.-Aug. | |
| 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Lbs.) | | | | (\$1,000) | | | |
| 1,989 | 2,078 | 15,820 | 16,112 | 1,182 | 1,592 | 8,950 | 9,673 |

Compared with the same month a year earlier, purchases in August 1963 were down 4.3 percent in quantity and 25.7 percent in value. Purchases in August 1963 included 780,922 pounds of shrimp, 281,093 pounds of ocean perch fillets, 236,285 pounds of scallops, 195,740 pounds of flounder fillets, 135,036 pounds of haddock fillets, 124,844 pounds of halibut, and 95,789 pounds of oysters, as well as substantial quantities of cod fillets and fish sticks.

Although not included in the data shown in table 1, a total of 32,900 pounds of freeze-dried fish squares valued at \$164,130 were purchased in August 1963 for the use of the Armed Forces. It has been reported that the Defense Subsistence Supply Centers have been purchasing freeze-dried fish squares for about three years. The squares are prepared from cod and haddock portions and are distributed in number 10 cans.

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, August 1963 with Comparisons

| Product | QUANTITY | | | | VALUE | | | |
|--------------------------|----------|------|-----------|-----------------------|--------|------|-----------|-------|
| | August | | Jan.-Aug. | | August | | Jan.-Aug. | |
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Lbs.) | | | | (\$1,000) | | | | |
| Tuna | - | - | 2,064 | 3,708 | - | - | 1,007 | 2,062 |
| Salmon | - | - | 18 | 1,016 | - | - | 12 | 638 |
| Sardine | 11 | 1 | 332 | 54 | 4 | 1/ | 135 | 27 |

1/Less than \$500.

Canned: Purchases of canned fishery products for the use of the Armed Forces were light in August 1963.

* * * * *

January-September 1963: Fresh and Frozen: For the use of the Armed Forces, less fresh and frozen fishery products were purchased in September 1963 than in the previous month. The decline was 6.8 percent in quantity and 16.1 percent in value.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, September 1963 with Comparisons

| QUANTITY | | | | VALUE | | | |
|--------------------------|-------|------------|--------|-----------------------|-------|------------|--------|
| September | | Jan.-Sept. | | September | | Jan.-Sept. | |
| 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Lbs.) | | | | (\$1,000) | | | |
| 1,853 | 1,822 | 17,673 | 17,934 | 992 | 1,302 | 9,942 | 10,975 |

Compared with the same month a year earlier, purchases in September 1963 were up 1.7 percent in quantity but down 23.8 percent in value. Purchases in September 1963 included 553,250 pounds of fresh shrimp, 348,026 pounds of ocean perch fillets, 175,457 pounds of scallops, 171,052 pounds of halibut, 165,663 pounds of flounder fillets, 143,107 pounds of haddock fillets, and 125,945 pounds of oysters, as well as considerable quantities of sole fillets, cod fillets, fish sticks, clams, and headed and gutted whiting.

During the first 9 months of 1963, fresh and frozen purchases were down 1.4 percent in quantity and 9.4 percent in value from those in the same period of the previous year.

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, September 1963 with Comparisons

| Product | QUANTITY | | | | VALUE | | | |
|--------------------------|-----------|------|------------|-----------------------|-----------|------|------------|-------|
| | September | | Jan.-Sept. | | September | | Jan.-Sept. | |
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Lbs.) | | | | (\$1,000) | | | | |
| Tuna | 647 | - | 2,711 | 3,708 | 290 | - | 1,297 | 2,062 |
| Salmon | 12 | - | 30 | 1,016 | 8 | - | 20 | 638 |
| Sardine | 43 | 11 | 375 | 65 | 15 | 4 | 150 | 31 |

Canned: Tuna was the principal canned fishery product purchased in September 1963 for the use of the Armed Forces. Purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) in the first 9 months of 1963 were down 34.9 percent in quantity and 46.3 percent in value from those in the same period of the previous year. The decline was due to lower purchases of canned tuna and salmon.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

(2) See Commercial Fisheries Review, January 1964 p. 9.



Films

NEW OCEANOGRAPHIC FILM SHOWS WORK OF MARINE SCIENTISTS:

A new oceanographic motion picture color film, "The Restless Sea," was shown over NBC-TV on January 24, 1964. The hour-long film (the latest in the Bell System Science Series) describes the work of oceanographers in searching out the complex relationships of nature in the sea.

The film combines photographed action both above and below the surface of the sea. In filmed and animated sequences, it illustrates the work of marine scientists in searching out the interwoven relationships of animals and plants in the oceans. A number of the interesting sequences include such subjects as hurricanes and mountainous waves; animal life from plankton to sharks to whales; modern scientific instruments that probe the depths to obtain a record of early life on earth; and the latest oceanographic research vessels consisting of both surface ships and undersea vehicles.

"The Restless Sea" was produced by Walt Disney Productions with the technical assistance of the Director of the Institute of Marine Science, University of Miami.



Great Lakes Fishery Investigations

WHITEFISH SPAWNING SURVEY IN WESTERN LAKE SUPERIOR:

M/V "Siscowet" Cruise 10 (November 18-December 17, 1963): The assessment of spawning whitefish in western Lake Superior was the primary objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Siscowet. Large-mesh gill nets (4½-to 5½-inch mesh, stretched measure) fished on spawning grounds off the north end of Cat Island yielded 214 whitefish (171 males and 43 females) ranging from 17.2 to 32.0 inches long (average of 19.5 inches).

The total number of fish caught and the catch per unit-of-effort was the highest since assessment studies began in 1958. Nearly all of the fish were tagged and released. Seven whitefish, recaptured by commercial fishermen and by the Siscowet, had returned to spawn on the same grounds where they were tagged during the 1962 spawning run. Small-

mesh gill nets fished on the whitefish spawning grounds caught predominately round whitefish and longnose suckers, and smaller numbers of lake herring. Water temperatures on the whitefish spawning grounds ranged from 45° to 47.5° F.

Other activities during this cruise included the collection of fertilized eggs from lake whitefish, round whitefish, and "bloater" chubs for studies of embryonic and larval development, and the collection of blood samples from eight species for electrophoretic and serological studies.

During the 1963 field season, the Siscowet caught 2,522 juvenile lake trout (1,511 in bottom trawls and 1,011 in experimental gill nets), of which 97 percent were fin-clipped. Most common in the trawl catches were lake trout planted at Bayfield, Wis., in the spring of 1962-63; gill nets caught predominately fish from the 1960-61 Bayfield plants. The survival of lake trout planted in 1960-62 appears to be better than for fish stocked in 1959 or 1963.

Gulf Fishery Investigations

Some of the highlights of studies conducted by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries during October-December 1963:

SHRIMP FISHERY PROGRAM: Shrimp Larvae Studies: On three occasions, spawn were obtained from ripe female brown shrimp (Penaeus aztecus) held in the laboratory. In 1 instance, the developmental sequence of the resulting larvae was carried as far as the mysis stage, and in 2 others to the postlarval stage. Specimens of all stages were preserved for descriptive purposes. During the last experiment, the following variables or conditions were observed for their effect on rearing success:

(1) Media--eggs were spawned and hatched in bay water with a salinity of 28‰ (parts per thousand). The larvae were then isolated and held in vitamin-enriched (offshore) sea water with a salinity of 36‰ to 38‰ (parts per thousand). Water was changed daily.

(2) Antibiotics--a combination of penicillin and dihydrostreptomycin was added to the water in which the ripe females were held. The treatment depressed the level of undesirable organisms until after hatching took place.

(3) Temperature--eggs were spawned and hatched at 25° C. (77° F.). The resulting larvae were isolated and maintained at 30° C. (86° F.).

(4) Rearing Containers--eggs were spawned and hatched in fiberglass aquaria holding 80 liters of water.

For rearing, units of 30 specimens of Nauplius I were placed in 250-milliliter beakers containing approximately 100 milliliters of medium. When the larvae reached the second protozoal stage their numbers were reduced to 10 per beaker.

(5) Feeding--during the initial feeding stage, i.e., Protozoa I, the larvae were fed diatoms (*Skeletonema* sp.). Newly hatched brine shrimp (*Artemia* sp.) nauplii were added when the second protozoal stage was reached. The *Skeletonema* was eliminated from the diet at the first postlarval stage.

Excluding preserved specimens, the survival rate was 19 percent from the first naupliar through the first postlarval stage. With slight modifications in rearing procedure, an improvement in survival rate may be possible in the future. Approximately 60 brown shrimp postlarvae obtained from the rearing trials are being maintained in the laboratory. A single juvenile rock shrimp (*Sicyonia brevirostris*) reared from a spawn in the spring of 1963 was still surviving in late 1963.

Distribution and Abundance of Larvae: Examination of 47 plankton samples collected outside the 7½-fathom contour line between Galveston and Brownsville, Tex., in December 1962 showed that penaeid larvae and postlarvae were distributed over the entire sampling area. In December 1962, plankton tonic stages were 3 to 16 times more abundant at the 25-, 35-, and 60-fathom stations than at the 15- and 45-fathom stations. None were encountered at the 7½-fathom stations.

In November 1963, an effort was made to gain additional information on the vertical distribution of penaeid larvae and postlarvae. The findings differed markedly from those obtained during the summer of 1963 when the resulting data indicated that, although the greatest concentrations of all penaeid planktonic stages occurred at and below mid-depth (18 meters), all stages tended to move upwards during the hours of darkness. This was not the case in November when all stages were evenly distributed throughout the water column regardless of the time of day. Temperature profiles taken during the 1963 summer studies indicated a vertically stable water mass with a well-developed thermocline, whereas in November 1963, an isothermal, mixed water mass prevailed. It is believed that the (vertical) mixing process overcame the ability or need of the organisms to respond to light changes.

Florida Bay Ecology Studies: Pink shrimp (*Penaeus duorarum*) habitat in eastern Florida Bay was surveyed with respect to water depth, bottom type, and submerged vegetation. This provided new insight into the types of sampling gear that will be required. Four types of stationary shrimp traps were field-tested in Florida Bay as well as in parts of Biscayne Bay. The traps varied from a small rectangular plexiglas model to a 3-foot square metal trap with a 24-foot plastic lead. All types captured shrimp in shallow-water areas. The key to successful sampling apparently is the proper design and setting of the trap lead.

In addition to traps, a sampler which removes all shrimp (or a constant known percentage) from a defined area of bottom is being investigated. Capturing all the shrimp contained within a specified sample area is difficult. Some shrimp may remain buried even at night. Two approaches to the problem are being explored. One entails enclosing the area and pumping all shrimp within it out of the bottom mud or sand into a screened con-

tainer at the surface. A second approach involves enclosing the area and, by means of a built-in trap, removing all the shrimp enclosed. This procedure may necessitate using a repellent or attractant to get all the shrimp out of the mud and into the trap. Such "drop traps" can be fished overnight. Some success has been obtained with both methods and further developmental studies of the sampling techniques are planned.

Surveys of Postlarval Abundance and Fisheries for Bait (Juvenile) Shrimp: Rearing experiments were started during the fourth quarter of 1963 to determine the accuracy of present techniques for identifying postlarval shrimp. The regular semiweekly samples of postlarvae were preserved and identified. In addition, live postlarvae, taken at the same time and place, were reared to identifiable size in glass aquaria supplied with sea-water from a recirculating system. Three such rearing experiments were completed. In each instance, there was a discrepancy of less than 5 percent between the identification of the field-preserved postlarvae and those reared to the juvenile stage in the laboratory.

As usually happens late in the year, the number of postlarvae in sample catches declined rapidly during the fourth quarter of 1963.

The catch composition of juvenile shrimp from Galveston Bay indicated that brown shrimp juveniles left the bays earlier in 1962 than in 1963. Commercial bait shrimp production in the Galveston Bay area during November 1963 was down sharply from that in the same month in 1962, while fishing effort showed an increase in November 1963.

| Month | Year | Catch Lbs. | Catch Composition Shrimp | | Fishing Effort Hrs. | Average Catch Per Hour Lbs. |
|----------|------|---------------|-----------------------------|-------|---------------------------|--------------------------------------|
| | | | Brown | White | | |
| October | 1963 | 178,900 | 20 | 80 | 5,210 | 34.3 |
| | 1962 | 160,200 | 10 | 90 | 3,450 | 46.4 |
| November | 1963 | 32,300 | 5 | 95 | 1,440 | 22.4 |
| | 1962 | 93,500 | 1 | 99 | 1,740 | 53.7 |
| December | 1963 | 1/ | 1/ | 1/ | 1/ | 1/ |
| | 1962 | 31,400 | 0 | 100 | 420 | 74.8 |

1/Not yet available.

Migrations, Growth, and Mortality of Brown and White Shrimp: Of the 4,801 stained and 1,208 tagged brown shrimp released on the bottom in 5 to 8 fathoms off the Mississippi coast in June 1963, a total of 421 (9 percent) stained shrimp and 63 (5 percent) tagged shrimp were recovered by the end of 1963. More than 91 percent of the recaptured shrimp had moved less than 30 miles. The greatest movement was about 85 miles from Horn Island to Southwest Pass, the most westerly of the several mouths of the Mississippi River. Appreciable offshore movement was not apparent, as only 9 percent of the returned shrimp were captured beyond the 11-fathom depth contour and less than 1 percent beyond 16 fathoms.

Analysis of the length-at-recapture data revealed a difference between the growth rates of males and females. The data showed that during the summer, the marked males increased in size from 115 millimeters or 59 count heads-off per pound to 131 mm. (38 count) and the marked females increased in size from 115 mm. (59 count) to 135 mm. (35 count) in 4 weeks.

In August 1963, a total of 3,016 brown shrimp were stained and released in the 10- to 12-fathom range off

Aransas Pass, Tex. Of those, 58 have been returned. Most of the recoveries were made inside the 15-fathom contour and within 30 miles of the release area. The longest movement recorded was 65 miles in a southerly direction.

Returns from the white shrimp mark-recapture experiment undertaken in Galveston Bay in August 1963 appear to be complete with 411 (13 percent) of the 3,115 stained individuals having been recovered through October 1963. There did not appear to be any seaward movement of the marked group. Most of the shrimp were recovered in the upper portion of the Bay where they were released, and none were recovered in the Gulf of Mexico. Those recoveries are providing the best current estimates of growth for this species. Length-at-age data reveal that during the August-September 1963 period the experimental shrimp increased in size from 99 mm. (98 count) to 134 mm. (39 count) in 4 weeks.

Population Dynamics: One of the objectives of the work is to increase, through more accurate knowledge of fishing intensity, the reliability of mortality coefficients estimated from mark-recapture experiments. Thus, when the relative fishing power of vessels constituting a fleet is known, statistics of time spent fishing can be adjusted to standard units of fishing intensity which, in turn, bear a constant (theoretical) relationship to resulting mortality coefficients. A considerable volume of data from the two areas has been collected and is being prepared for machine processing.

CONTRACT RESEARCH: Abundance and Distribution of Pink Shrimp Larvae on the Tortugas Shelf: Plankton samples were collected with a 3-inch centrifugal pump from Buttonwood Canal at Flamingo, Fla. In addition, plankton were sampled at each of 10 stations during 3 research cruises on the Tortugas Shelf. (This research is being conducted by the University of Miami under contract.)

Analysis of postlarval data from Buttonwood Canal samples followed and a summary of results was prepared. Generally speaking, peak influx (abundance) of postlarvae always occurred in association with flood tides; smaller peaks were frequently observed during ebb tides. That relationship held during all lunar stages, although the greatest numbers of postlarvae were taken during new-moon phases. The data also suggest that, during the annual cycle in 1962-1963, there occurred two peaks in the movement of postlarvae into the Whitewater Bay estuarine complex via Buttonwood Canal. A small peak appeared in late January and early February 1963, followed by a larger peak which extended over the period July-October 1963. Some postlarvae enter the Whitewater Bay nursery grounds during each month of the year, but there may be a seasonal variation in the age, or at least in the stage of development, at which they do so. A stage (age) index based on the number of rostral spines per individual postlarva was calculated for each series of samples. Index analysis indicated that the February postlarvae were the least advanced in development and that the stage of development at entry increased steadily from July through September.

Juvenile Phase of the Life History of the Pink Shrimp in Everglades National Park (Fla.) Nursery Grounds: During the period October 19-December 19, 1963, a total of 14 nights of sampling yielded 96 collections with the channel net and 80 with the wing nets. A comparison of simultaneous catches revealed that the ratio of the

number of juvenile shrimp caught in the wing nets to that of individuals caught in the channel net varied considerably. Because of inconsistent results, the channel net remains the primary sampling device while possible sources of sampling variation (in the case of the wing nets) are being explored. (This research is being conducted by the University of Miami under contract.)

Abundance of Postlarval Shrimp in Mississippi Sound and Adjacent Waters: Sampling for the occurrence and abundance of postlarval shrimp continued at 18 stations in Mississippi Sound. In October 1963, postlarval pink shrimp were found to be more numerous than either white or brown shrimp postlarvae. Thereafter, each of the three species declined in abundance and were absent from collections made in mid-December. The decline of postlarvae appeared to precede extreme drops in water temperature. (This research is being conducted by Gulf Coast Research Laboratory under contract.)

Seasonal Distribution of Postlarval Shrimp in Vermilion Bay (La.): Regular sampling at 4 weekly and 4 biweekly stations in Vermilion Bay continued. The number of white shrimp postlarvae per collection gradually declined during October 1963 with the last one appearing in a sample taken on November 2. Brown shrimp postlarvae were not found at any station after October 26, 1963. No pink shrimp postlarvae were taken during the quarter. (Southwestern Louisiana University is conducting the research under contract.)

Seasonal Distribution Patterns of Adult and Larval Shrimp in Aransas Pass (Tex.) Inlet: The tide trap was operated at or near maximum flood and ebb tides approximately three times per week throughout the quarter. Although large numbers of marine organisms were captured, few penaeid shrimp were encountered. Immediately after the passage of cold fronts, trap catches of all organisms increased greatly during ebb tides. Apparently, concomitant low tides and low water temperatures cause a mass exodus of organisms from the shallow bays, through the Aransas Pass Inlet, into the deeper shelf waters of the Gulf of Mexico.

Separation, classification, and enumeration of organisms in plankton samples from the Aransas Pass study area were accelerated. Average numbers of brown and pink shrimp larvae were calculated for all stations, depths, and sampling times within each sampling period. In general, brown shrimp postlarvae were more abundant during the late spring months while pink shrimp postlarvae were most numerous during late summer. Very few white shrimp postlarvae were taken. No larval or postlarval shrimp were found in the plankton samples from about October 1 until December 6, 1963, when a sample containing a few pink shrimp postlarvae was obtained. The occurrence of brown shrimp postlarvae could not be correlated with any recorded environmental or temporal variation such as tidal stage or time of day. Pink shrimp postlarvae always occurred in greatest numbers during highest flood tides regardless of the time of day. (This research is conducted by Texas Institute of Marine Science under contract.)

ESTUARINE PROGRAM: Ecology of Western Gulf Estuaries: Biological and hydrological sampling in the Galveston Bay system continued without interruption during the quarter. The second series of bottom fauna samplings, which included the identification and enumeration of all sample specimens, was completed. An investigation of the relationships between the distribution and abundance of bottom organisms and variations in

temperature, salinity, and bottom type was begun. In conjunction with the description of bottom types, an analysis of bottom sediments was almost completed. Checklists of the fish, shrimp, and crabs inhabiting the Galveston Bay system are being prepared. Researchers have identified 104 fish, 13 shrimp, 27 crab, and 34 mollusc species collected since January 1963. Previous literature is being reviewed to provide as complete a species list as possible. A reference collection of typical specimens has been established.

Due to the heavy rainfall accompanying the passage of Hurricane Cindy slightly northeast of the Galveston area on September 17, 1963, salinity was temporarily reduced throughout most of the Bay system and in the Gulf of Mexico near the Bay entrance jetties and in the entrance itself. Reductions of as much as 10‰ (parts per thousand) were noted in upper East Bay. The salinity in Trinity Bay, however, increased and remained abnormally high. In general, salinity during the fourth quarter of 1963 was lower at the Gulf of Mexico stations and in Galveston Entrance than during the previous quarter, and higher in the Bay system, with the exception of East Bay which was nearest the hurricane's path.

White shrimp, sand seatrout, and bay anchovy continued as the predominant species. Young-of-the-year Atlantic croakers began appearing in November 1963 with their numbers increasing in December. A decline in the number of brown shrimp and blue crabs was noticeable at the onset of cooler temperatures in November and December. White shrimp abundance also declined rapidly with a lowering of the water temperature during the latter half of December.

Between December 3 and 5, 1963, with the water temperature averaging 14.1° C. (57.4° F.), small white shrimp were caught at 60 of 64 stations at the rate of 38 individuals per 5 minutes of trawling with a 10-foot net. Only 8 percent of those shrimp were caught at stations located in deep channels. On December 20, at which time the water temperature averaged 8.3° C. (46.9° F.), the same species was collected at only 18 (mostly deep-water) stations at the reduced rate of 12 per 5 minutes of trawling. A limited amount of sampling activity 3 days later (December 23), when the water temperature reached a low of 2.0° C. (35.6° F.), yielded no shrimp. At that time numerous stunned and dead fish were observed and caught, including spotted seatrout, redfish, menhaden, croaker, black drum, and mullet. Neither the extensiveness nor severity of the mass mortality could be determined. Low temperatures occurred almost a month earlier this winter than last. In the previous winter (1962/63), comparable low temperatures were not recorded until the latter half of January. Last winter, white shrimp were also plentiful in the Bay system just prior to the onset of cold weather, but then virtually disappeared; and, although numerous stunned fish were also observed and collected in the previous winter, there was no indication that the low temperature had caused any mortality.

Effects of Engineering Projects: A study is being made of the possible effects of the Texas Basins Project on the fishery resources. This major project includes proposals to construct numerous upland reservoirs as well as a water transport canal to divert the flow of principal streams in water-rich east Texas to arid portions of southwest Texas. Such a plan would greatly reduce tributary inflow into most Texas estuaries. During drought years, this reduction could become critical, especially in view of other water demands which are expected in the future. Thus, from the standpoint of

lowering the quality of fishery resource habitat, the proposed Texas Basins Project would compound an already critical problem.

Data thus far analyzed include, for the years 1956-1963, monthly fresh-water discharges from major rivers and streams, and the quantity as well as value of in-shore and offshore harvests of fish and shellfish. Preliminary inspection of the data indicates a definite relationship between river discharge and shrimp harvest in the estuaries of eastern Texas. The data for west Texas estuaries and for fishery resources other than shrimp have not yet been analyzed.

INDUSTRIAL FISHERY PROGRAM: Life Histories of Central Gulf Bottomfish: Sampling of Atlantic croaker has been expanded to include juvenile specimens from Mobile Bay, Ala., and adult fish from the northern Texas Gulf coast.

Analysis of data on the length, age, sex composition, and reproductive status of croaker stocks was continued at an accelerated pace.

Distribution and Abundance of Western Gulf Bottomfish: In mid-fall 1963, information on the diurnal variation in the size and composition of sample bottomfish catches was obtained during a special cruise by a chartered research vessel. Results of comparative trawl hauls just above as well as on the bottom revealed, as in previous trials, day-night differences in the catchability of Atlantic croaker by bottom trawls. During periods of the day when trawling on the bottom proved ineffective, relative catches of that species increased measurably upon raising and fishing the trawl a short distance off the bottom. Sample catches of butterfish yielded similar results. The longspine porgy, though very abundant at one of the sampling depths, failed to exhibit diurnal variation in its catchability.

To facilitate night observations in a study concerning the diurnal activity of an experimental group of Atlantic croakers, a system of red floodlights was installed in a recirculating sea water system reservoir especially modified for such work.

SEA-WATER LABORATORIES: Facilities of the recirculating sea water system are being successfully used for experiments which involve raising to an identifiable size shrimp larvae hatched from eggs of known parentage. Experiments are also under way to determine if the stingray (*Dasyatis sabina*) is the final host of a parasitic cestode known to infect certain shrimp. In addition, researchers from the University of Texas School of Medicine are employing the facility to conduct experiments dealing with various aspects of the biochemical basis of learning in fish.

Toward the end of 1963, plans were almost completed for a long-term experiment to determine the physiological effects (if any) of marking-stains on shrimp.

BIOLOGICAL INDICATORS IN EAST LAGOON: Oyster growth experiments employing specimens suspended in the lagoon at the laboratory site revealed that the maximum increase in weight occurred during October. The average gain in October 1963 was 12.7 grams. This dropped to 8.0 grams in November, and to 4.0 grams during December. The average growth increments of oysters held in the laboratory itself, i.e., in a tank receiving the initial discharge from a circulation pump, were 2.0, 2.0, and 2.5 grams, respectively, for the same 3 months.

Note: See Commercial Fisheries Review, December 1963 p. 28.



Hawaii

SKIPJACK TUNA LANDINGS, 1963:

Skipjack tuna landings in Hawaii in December 1963 were estimated to be about 200,000 pounds--35,000 pounds below the 1948-62 monthly average for that month. The total catch of skipjack tuna in 1963 was estimated at 8,245,000 pounds, or 1,627,000 pounds below the 1948-1962 annual average for the same period.

In December there were 54 productive trips, giving an average of 1,871 pounds per productive trip. Individual catches ranged from 45 pounds to 6,975 pounds.



Industrial Fishery Products

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, December 1963: Preliminary data on U. S. production of fish meal, oil, and solubles for December 1963 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

| Area | Meal Short Tons | Oil 1,000 Pounds | Solubles .. (Short Tons) . . | Homogenized ^{2/} |
|----------------------------------|-----------------------|------------------------|---------------------------------|---------------------------|
| | | | | |
| December 1963: | | | | |
| East & Gulf Coasts . | 6,642 | 5,478 | 2,271 | - |
| West Coast ^{2/} | 1,749 | 254 | 986 | - |
| Total | 8,391 | 5,732 | 3,257 | - |
| Jan.-Dec. 1963 | | | | |
| Total | 230,045 | 184,005 | 92,554 | 7,216 |
| Jan.-Dec. 1962 | | | | |
| Total | 298,413 | 255,808 | 113,238 | 11,096 |

^{1/}Does not include crab meal, shrimp meal, and liver oils.
^{2/}Includes American Samoa and Puerto Rico.
^{3/}Includes condensed fish.
 Note: Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

* * * * *

Production, November 1963: During November 1963, 11,386 tons of fish meal and 10.0 million pounds of oil were produced in the United States. Compared with November 1962, this was an increase of 1,211 tons of meal and 1.8 million pounds of oil. A total of 4,139 tons of fish solubles was produced in November 1963--slightly less than in November 1962.

Fish meal production for January-November 1963 amounted to 221,056 tons--74,674 tons less than in the same period of 1962. Fish oil production for the first 11 months of 1963 amounted to 178.0 million pounds--a decrease of 77.2 million pounds. Fish solubles and homogenized condensed fish production amounted to 94,398 tons--a decrease of 28,098 tons or 23 percent.

| Product | November | | Jan.-Nov. | | Total |
|---|---------------|---------------|----------------|----------------|----------------|
| | 1/1963 | 1962 | 1/1963 | 1962 | |
| (Short Tons) | | | | | |
| Fish Meal and Scrap: | | | | | |
| Herring | - | 35 | 7,283 | 5,070 | 5,095 |
| Menhaden ^{2/} | 8,736 | 7,272 | 173,904 | 238,372 | 238,680 |
| Sardine, Pacific | 2/4 | 13 | 2/33 | 702 | 702 |
| Tuna and mackerel | 1,953 | 2,241 | 20,242 | 24,910 | 26,559 |
| Unclassified | 687 | 614 | 19,594 | 26,676 | 27,297 |
| Total | 11,386 | 10,175 | 221,056 | 295,730 | 298,333 |
| Shellfish, marine animal meal and scrap . | 3/ | 3/ | 3/ | 3/ | 12,899 |
| Grand total meal and scrap | 3/ | 3/ | 3/ | 3/ | 311,232 |
| Fish Solubles: | | | | | |
| Menhaden | 3,324 | 2,561 | 71,746 | 84,760 | 84,885 |
| Other | 815 | 1,714 | 15,428 | 26,772 | 28,353 |
| Total | 4,139 | 4,275 | 87,174 | 111,532 | 113,238 |
| Homogenized condensed fish | - | 544 | 7,224 | 10,964 | 11,096 |
| (1,000 Pounds) | | | | | |
| Oil, body: | | | | | |
| Herring | 279 | 31 | 5,340 | 5,085 | 5,255 |
| Menhaden ^{2/} | 9,195 | 7,612 | 159,594 | 237,746 | 237,815 |
| Sardine, Pacific | - | - | 2/6 | 166 | 167 |
| Tuna and mackerel | 425 | 475 | 5,275 | 4,832 | 5,175 |
| Other (including whale) | 108 | 136 | 7,457 | 7,300 | 7,396 |
| Total oil | 10,007 | 8,254 | 177,972 | 255,129 | 255,808 |

^{1/}Preliminary data.
^{2/}Includes a small quantity of thread herring.
^{3/}Not available on a monthly basis.
 Note: Beginning with February 1963, fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

* * * * *

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-November 1963: Based on domestic production and imports, the United States available supply of fish meal for January-November 1963

| Item | Jan.-Nov. | | Total |
|---|----------------|----------------|----------------|
| | 1/1963 | 1962 | |
| (Short Tons) | | | |
| Fish Meal and Scrap: | | | |
| Domestic production: | | | |
| Menhaden | 173,904 | 238,372 | 238,680 |
| Tuna and mackerel | 20,242 | 24,910 | 26,559 |
| Herring | 7,283 | 5,070 | 5,095 |
| Other | 19,627 | 27,378 | 40,898 |
| Total production | 221,056 | 295,730 | 311,232 |
| Imports: | | | |
| Canada | 47,177 | 40,470 | 42,806 |
| Peru | 268,938 | 173,099 | 186,249 |
| Chile | 23,197 | 8,475 | 9,247 |
| So. Africa Republic | 9,374 | 9,984 | 10,084 |
| Other countries | 3,942 | 1,302 | 3,921 |
| Total imports | 352,628 | 233,330 | 252,307 |
| Available fish meal supply | 573,684 | 529,060 | 563,539 |
| Fish Solubles: | | | |
| Domestic production^{2/} | | | |
| | 94,398 | 122,496 | 124,334 |
| Imports: | | | |
| Canada | 1,902 | 1,236 | 1,335 |
| Iceland | 55 | 2,205 | 2,332 |
| So. Africa Republic | 191 | 1,717 | 1,717 |
| Other countries | 1,465 | 763 | 924 |
| Total imports | 3,613 | 5,921 | 6,308 |
| Available fish solubles supply | 98,011 | 128,417 | 130,642 |

^{1/}Preliminary.
^{2/}50-percent solids. Includes production of homogenized condensed fish.

amounted to 573,684 short tons--44,624 tons (or 8.4 percent) more than during the same period in 1962. Domestic production was 74,674 tons (or 25.3 percent) less, but imports were 119,298 tons (or 51.1 percent) higher than in the same period in 1962. Peru continued to lead other countries with shipments of 268,938 tons.

The United States supply of fish solubles (including homogenized fish) during January-November 1963 amounted to 98,011 tons--a decrease of 23.7 percent as compared with the same period in 1962. Domestic production and imports dropped 22.9 percent and 39.0 percent, respectively.



Maine Sardines

CANNED STOCKS, JANUARY 1, 1964:

Canners' stocks of Maine sardines on January 1, 1964, were 29,000 cases less than those on hand January 1, 1963, but were 919,000 cases above stocks on hand two years ago on January 1, 1962 (the pack for the 1961 season was unusually small).

A total of 60,000 cases or 23.0 percent of distributors' stock were held in warehouses of retail multiunit organizations on January 1, 1964, compared with 67,000 cases or 24.7 percent a year earlier.

The 1963 season pack totaled 1,584,000 standard cases, according to the Maine Sardine Council. On April 15, 1963, carryover stocks at the canners' level amounted to about

Table 1 - Canned Maine Sardines--Supply as of December 31, 1963, with Comparisons

| Item | 1963 | 1962 | 1961 |
|--|-----------------------|-----------|-----------|
| | (Std. Cases 1/) | | |
| Canners' carryover stocks on April 15 2/ | 660,000 | 33,000 | 457,000 |
| Season pack 2/ | 1,584,000 | 2,117,000 | 671,000 |
| Total supply at end of year | 2,244,000 | 2,150,000 | 1,128,000 |

1/100 3 3/4-oz. cans equal one standard case.
2/The usual legal packing season in Maine, extending from April 15 to Dec. 1, was in effect during the 1961 and 1963 seasons. The 1962 season was extended to 13 months--Dec. 2, 1961-Jan. 1, 1963--but the 1962 pack canned before April 15 was insignificant.

660,000 cases. Adding the 1963 season pack results in a total supply of 2,244,000 cases as of Jan. 1, 1964--up 4.4 percent from the total supply reported Jan. 1, 1963, and higher by 98.9 percent from the short supply of 1,128,000 cases as of Jan. 1, 1962. Shipments in 1963 from the start of the canning season amounted to 1,181,000 cases compared with 1,057,000 cases shipped in the previous year.



North Pacific Fishery Investigations

JOINT UNITED STATES-CANADA SALMON RESEARCH IN NORTH PACIFIC:

A salmon winter research cruise into the North Pacific Ocean and Bering Sea during January-March 1964 was scheduled by the research vessel George B. Kelez (operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Seattle, Wash.).

During the first part of the cruise the United States vessel was to operate jointly with



Research vessel George B. Kelez of the U. S. Bureau of Commercial Fisheries.

Table 2 - Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, January 1, 1964, with Comparisons 1/

| Type | Unit | 1963/64 Season | | 1962/63 Season | | | | 1961/62 Season | | | | | |
|--------------|---------------------|----------------|---------|----------------|--------|--------|--------|----------------|--------|--------|--------|--------|---------|
| | | 1/1/64 | 11/1/63 | 7/1/63 | 6/1/63 | 4/1/63 | 1/1/63 | 11/1/62 | 7/1/62 | 6/1/62 | 4/1/62 | 1/1/62 | 11/1/61 |
| Distributors | 1,000 actual cases | 261 | 308 | 217 | 215 | 264 | 271 | 230 | 134 | 99 | 148 | 193 | 202 |
| Canners | 1,000 std. cases 2/ | 1,063 | 1,255 | 643 | 536 | 699 | 1,092 | 1,348 | 374 | 50 | 45 | 144 | 221 |

1/ Table represents marketing season from November 1-October 31.
2/ 100 3 3/4-oz cans equal one standard case.
Note: Beginning with the Canned Food Report of April 1, 1963, U. S. Bureau of the Census estimates of distributors' stocks were based on a revised sample of merchant wholesalers and warehouses of retail multiunit organizations. The revised sample resulted in better coverage. The January 1, 1963, survey was conducted with both samples to provide an approximate measure of the difference in the two samples. That survey showed that the estimate of distributors' stocks of canned Maine sardines from the revised sample was 13 percent above that given by the old sample.
Source: U. S. Bureau of the Census, Canned Food Report, January 1, 1964.

the Canadian research vessel G. B. Reed in a salmon fishing and tagging operation covering the North Pacific Ocean between the North American coast and longitude 180° and extending from the Alaskan coastline and Aleutian Islands arc to approximately latitude 41° N. Following that phase of the cruise, the George B. Kelez was to sail into the Bering Sea and fish stations between longitudes 175° E. and 170° W. and extending north as far as weather and ice conditions permitted.

The research cruises of the United States and Canada are part of a continuing study to determine salmon distribution and abundance, migration routes during the winter months, and to study ecological and oceanographic factors affecting salmon. The research vessels of both countries were to fish Japanese long-line gear to catch salmon for tagging. The United States also was to carry on comparative fishing with gill nets.

The cruise of the George B. Kelez was to take about 2½ months with the vessel returning to her home port of Seattle about the end of March.



Nutrition

RESEARCH PROGRAM ON COMPOSITION AND NUTRITIVE VALUE OF FISHERY PRODUCTS:

Only very little documented information on the composition and nutritive value of fish and fishery products has been available. Such information would be valuable to scientists who are planning programs of basic and applied fisheries research since much essential information necessary for such problems would be immediately at hand. Also, a knowledge of the composition and nutritive value would enhance the marketing of various species of fish and shellfish. The American people have become increasingly diet conscious and are demanding more knowledge on cholesterol, vitamin, mineral, and caloric content of various food items.

In view of this, the U. S. Bureau of Commercial Fisheries early in 1963 initiated a research program on the composition and nutritive value of fishery products. The program is being conducted by scientists at the Bureau's Pascagoula Technological Laboratory.

The following data is being accumulated on the composition and nutritive value of fish products: (1) Proximate composition (moisture, oil, protein, ash, carbohydrate), (2) Amino acid analysis, (3) Trace mineral content, (4) Vitamin content, (5) Essential fatty acids, (6) Sterols and phospholipids.

As the data is collected it will be the objective of the Pascagoula Technological Laboratory to set up an automatic data processing (ADP) center for assembling and making available information on the nutritive value of fishery products on a national scale. The availability of an ADP would add to the value of the data because it could be evaluated statistically as influenced by various factors. The principal factors involved in this study include: (1) influence of seasonal changes; (2) influence of geographical considerations; (3) influence of inter-species relationship; and (4) influence of type of tissue.

Another objective of the study is to publish a nutritive profile of each species of fish of major commercial importance, both in terms of 100 grams of meat and in terms of table portion size. This would be of considerable help to the dietician or housewife in preparing well-balanced meals.



Oceanography

INDIAN OCEAN EXPLORATIONS BY THE "PIONEER"

The U. S. Coast and Geodetic Survey research vessel Pioneer sailed from San Francisco, Calif., on February 11, 1964, for a six-months cruise in the Indian Ocean that will involve a traverse of more than 27,500 miles. The 312-foot oceanographic vessel is participating in the International Indian Ocean Expedition. This five-year study (1960-64), involving about 25 countries and 44 vessels, is sponsored by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). One of the major objectives of the expedition is the location and subsequent development of new fisheries in the area.

The scientists aboard the Pioneer will study the Indian Ocean's physical, chemical, meteorological, geological, biological, and geophysical aspects. It is anticipated that a wealth of new knowledge will be accumulated.

Among the subjects of detailed exploration will be undersea canyons, including the Ganges Submarine Canyon in the Bay of Bengal and the Trincomalee Submarine Canyon off Ceylon. Elsewhere during the cruise, the Pioneer will study the deep trenches found en route, including the Java, Philippine, Palau, and Yap Trenches, as well as the Mariana Trench off Guam, the deepest spot on earth.

Scientists will chart the mountains and valleys of the ocean floor; photograph the bottom with deep-sea cameras; study its sub-surface structure; and take samples of marine rocks and sediment. They will also measure the temperature of the water at various depths (five miles deep at some points), and will analyze its salinity and dissolved oxygen content. They will also record the surface and deep ocean currents. Particular study will be given to the interplay of winds and ocean currents and U. S. Weather Bureau specialists will compile data on the atmosphere above the ocean. Scientists are especially interested in the influence of the Asiatic monsoons on the surface currents of the Indian Ocean. (U. S. Coast and Geodetic Survey, February 9, 1964.)



SALMON EGG TAKE IN 1963 SETS NEW RECORD:

Over 100 million salmon eggs were taken by Oregon State hatcheries in 1963. This included 41,895,203 fall chinook, 18,033,515 spring chinook, 40,311,943 silver salmon, 344,898 chum salmon, and 694,385 steelhead eggs. The yield in 1963 surpassed the previous record in 1939 when 91 million salmon and steelhead eggs were taken for hatchery use. In the years since the end of World War II, the average annual Oregon State salmon egg take has been 43.5 million.

With the 1963 salmon egg take far exceeding the yearling rearing capacity of the 15 Oregon State Fish Commission hatcheries, 14.5 million silver salmon eggs and 8.6 million fall chinook eggs were transferred to other Agencies, including the Washington State Department of Fisheries, the U. S. Fish and Wildlife Service, the Idaho Department of Fish and Game, and the California Department of Fish and Game. (Oregon Fish Commission, January 20, 1964.)



Preservation

QUALITY OF FISH HELD IN REFRIGERATED SEA WATER TESTED:

Better refrigeration techniques for holding fish at sea are being continually sought by the U. S. Bureau of Commercial Fisheries. This is essential since the quality of a fish product marketed for human consumption is largely dependent on the treatment received before it enters the processing plant. Several studies were under way early in 1964 at the U. S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass., to determine methods for extending the shipboard storage life of fish, one of which includes the use of refrigerated sea water.

The project is being conducted in two major phases: (1) laboratory tests, and (2) shipboard trials.

The laboratory tests were conducted to determine whether or not an increase in storage life of fish can be attained when using refrigerated sea water as compared to ice. In addition, an ultraviolet sterilizing unit was installed in the sea-water tank to determine its effectiveness in reducing the bacterial load in the circulating sea water and the feasibility of installing this unit for shipboard use. Ocean perch were held in the laboratory sea-water tanks at a temperature of 30° F. Samples from the same lot were held in ice for comparative purposes.

Organoleptic examinations were made at varying intervals of storage on both the raw and cooked fish. The final evaluation of cooked ocean perch by a taste panel was based on the average ratings for appearance, odor, flavor, and texture. The ratings indicated that iced ocean perch was acceptable until the 10th day, whereas those stored in refrigerated sea water were acceptable from the 14th to 17th days. Striking reductions in bacterial plate counts were found as a result of circulating sea water through the ultra-violet water unit. In two separate tests, plate counts were reduced from 12 million bacteria per milliliter to 3,000 per milliliter and 380,000 to less than 10 milliliter when circulated for 2 hours and 3½ hours, respectively.

The ocean perch vessel Judith Lee Rose (home port Gloucester, Mass.) was equipped with the necessary refrigeration equipment to conduct shipboard trials for evaluating the use of refrigerated sea water for fish storage. In

addition to the refrigeration system, an ultraviolet sterilizing unit was installed to reduce the buildup of bacteria in the circulating sea water. Several adversities were encountered during the trials carried out as of January 1964. Overheating of refrigeration condenser, malfunction of recording thermometer, breakage of ultraviolet units, and improper rate of water circulation. After the experience of 2 or 3 sea trials the shortcomings of the storage equipment were determined and subsequently modified.

During the final trial, 1,200 pounds of ocean perch were held for 10 days in refrigerated sea water circulated through the ultraviolet unit. All systems functioned properly during the entire trip, with the water remaining at a temperature of 30°-33° F. The use of refrigerated sea water for the storage of ocean perch on the vessel has a tendency to leach out the normal red color. This phenomenon had no adverse effects on the edible meat quality, but fish buyers are found to be somewhat skeptical about buying the discolored product.

Although the success of the shipboard trials was limited it is felt that much was learned concerning the technical problems encountered in setting up and operating a shipboard unit. The knowledge gained should be of considerable value on future trials.

Note: See Commercial Fisheries Review, January 1963 p. 47.



South Atlantic Exploratory Fishery Program

FISHERY EXPLORATIONS FOR COMMERCIAL SPECIES OFF GEORGIA CONTINUED:

M/V "Silver Bay" Cruise 52 (December 3-17, 1963): To continue assessment of the distribution, composition, density, and availability of bottomfish resources of the continental shelf off the coast of Georgia in depths greater than 10 fathoms was the primary objective of this 15-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay.

To delimit areas of trawlable bottom and to determine if "broken bottom" areas (snapper lumps) similar to those previously located off South Carolina and north Florida exist off Georgia, a preliminary survey of the topographic features of the area was made. Exploratory gear used consisted of 50/70-foot and 70/90-foot nylon, roller-rigged fish trawls

with 6½- and 8-foot bracket doors. Cod ends were 2-inch mesh.

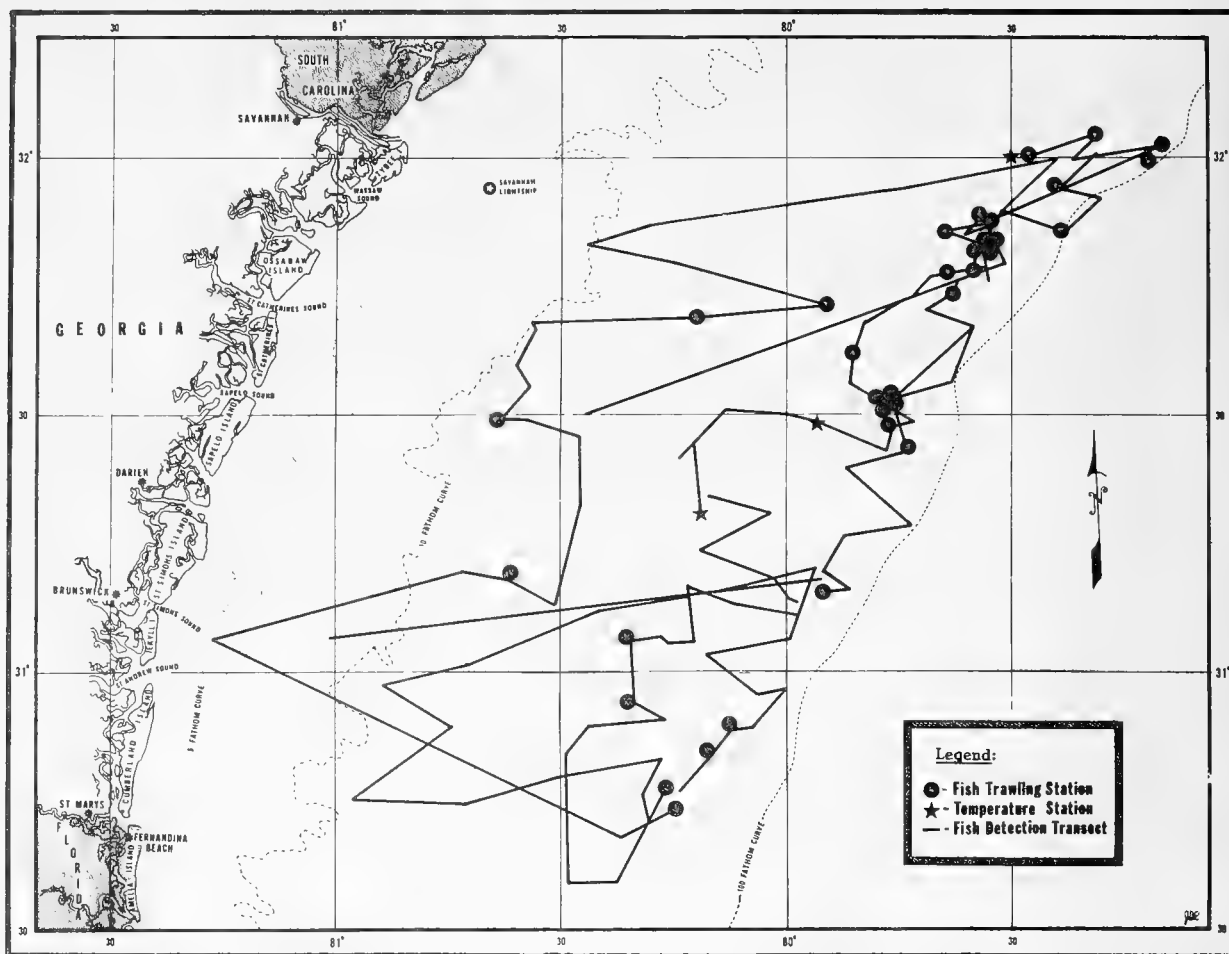
Over 900 miles of transects were run with a "whiteline" depth recorder for fish detection and bottom discrimination. A total of 17 trawl sets were made after locating fish shoals on the recorder and 17 sets were made when there were no recorded indications of fish. The entire area surveyed was found to be trawlable with the gear used and only two minor tearups were experienced.

For the most part, transects from 10 to 17 fathoms showed the bottom to be slightly irregular or undulating; from 17 to 30 fathoms the bottom was smooth except for an occasional irregularity; and beyond 30 fathoms the bottom remains smooth with a gradual increase in gradient to at least the 80-fathom isobath, the maximum depth surveyed. Only 4 small fish schools were observed between 10 and 17 fathoms and 3 drags in that depth range were unproductive. Extensive fish concentrations were observed between 18 and 50 fathoms. Many of the catches in that range were dominated by the filefish (Stephanolepis hispidus).

Three areas (off Savannah, Sapelo Island, and Cumberland Island) yielded moderate catches of commercially important food fish. The most productive depths were 35 to 40 fathoms (latitude 31° 45' to 32° 00' N.). The 10 most abundant species taken in 8 exploratory drags (14.3 hours fishing time) in that area were:

| Species Caught by M/V <u>Silver Bay</u> on Cruise 52 | | |
|--|---------------------------------------|--------------|
| Species | | Total Weight |
| Common Name | Scientific Name | Pounds |
| Pink porgy | <u>Pagrus pagrus</u> | 3,420 |
| Filefish | <u>Stephanolepis hispidus</u> | 2,578 |
| Roughtail stingray | <u>Dasyatis centroura</u> | 575 |
| White porgy | <u>Calamus sp.</u> | 570 |
| Vermilion snapper | <u>Rhomboplites aurorbens</u> | 511 |
| Grouper | <u>Mycteroperca & Epinephelus</u> | 141 |
| Jack | <u>Seriola sp.</u> | 113 |
| Red snapper | <u>Lutjanus aya</u> | 102 |
| Grunts, tomate | <u>Haemulon aurolineatum</u> | 58 |
| Black bar drum | <u>Pareques sp.</u> | 47 |
| Other | | 250 |
| Total | | 8,365 |

One- to two-pound pink porgies dominated those catches. Black sea bass, (Centropristes striatus), white porgy, red snapper, grouper, small vermilion snapper, and gray triggerfish (Balistes capricus) were taken in moderate numbers over a small area of broken bottom in 28 fathoms at latitude 31° 31' N.,



Areas investigated during Cruise 52 of the M/V Silver Bay (December 3-17, 1963).

longitude 70°46' W. Combined catches of those species were near 600 pounds per drag east of Cumberland Island in 21 to 22 fathoms. The species composition in that area was similar to the broken bottom areas off northern Florida and South Carolina.

No recordings of bottom fish schools were observed in the 50 to 80 fathoms depth range, although two 1-hour drags in 75 to 80 fathoms yielded catches of 4,000 and 3,000 pounds of small butterfish (*Poronotus triacanthus*). They averaged 12 per pound and modally were 10.5 centimeters (about 4¼ inches) long. Two drags in 50 to 60 fathoms yielded small catches of butterfish and round herring (*Etrumeus* sp.). Strong winds halted further exploration in that depth range.

Midwater schools of fish were observed in 30 to 60 fathoms from latitude 31°10' to

31°50' N. No surface schools of fish were observed during this cruise.

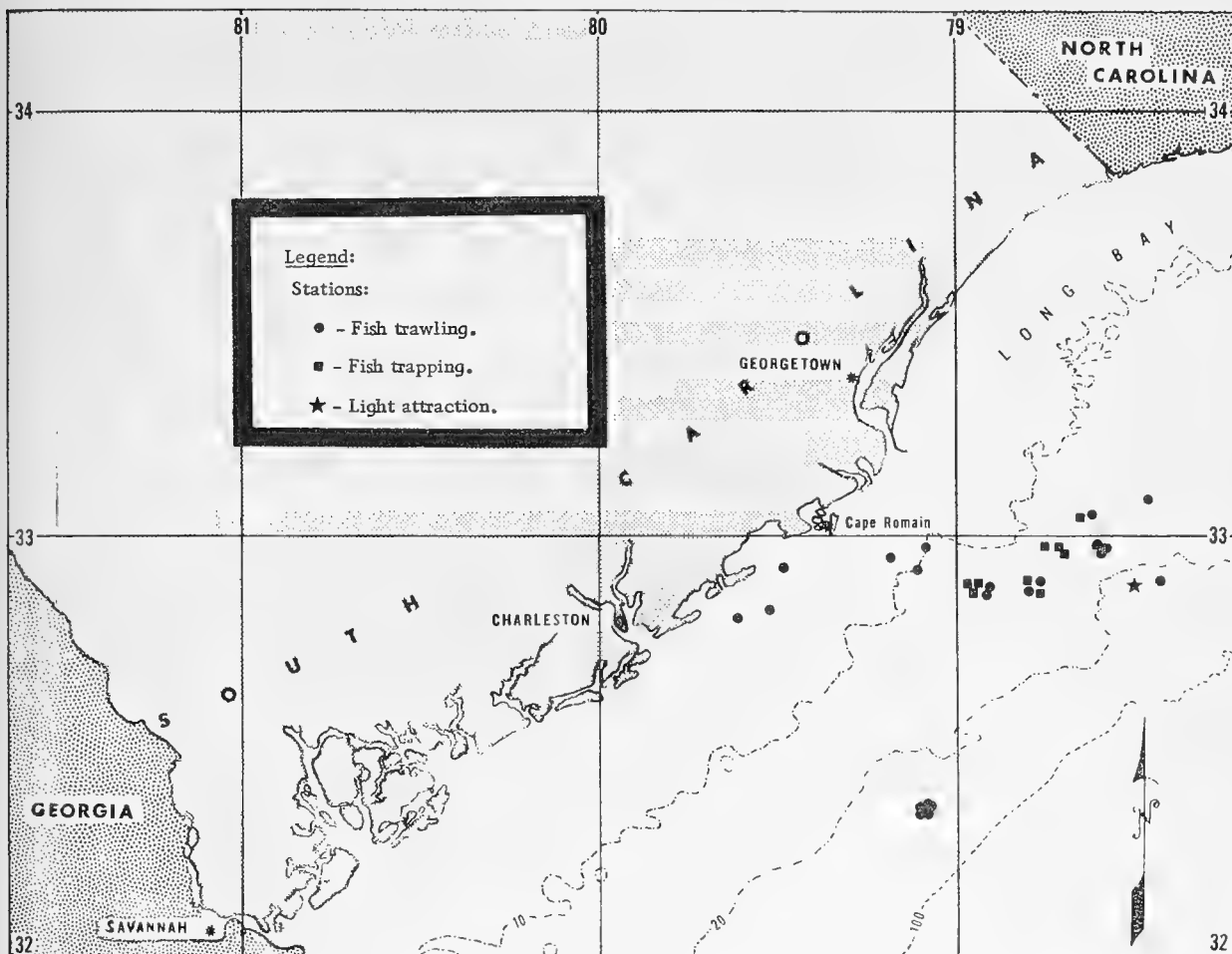
Note: See Commercial Fisheries Review, July 1963 p. 52.

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EXPLORATORY TRAWLING FOR COMMERCIAL SPECIES OFF SOUTH CAROLINA:

M/V "Silver Bay" Cruise 53 (January 9-22, 1964): To determine the seasonal availability of bottomfishes to fish trawls off the coast of South Carolina was the principal objective of this 14-day cruise by the exploratory fishing vessel Silver Bay. A second objective was to conduct preliminary trials with fish traps. Explorations during the cruise were hampered by strong northerly winds.

Sixteen fishing stations were fished with a 70/90-foot roller-rigged nylon fish trawl with 8-foot bracket doors. Most catches were



Areas investigated during Cruise 53 of the M/V Silver Bay (January 9-22, 1964).

dominated by small (3 to 4 per pound) scup (*Stenotomus chrysops*) which were taken in amounts averaging 1,653 pounds per drag and ranging up to 2,600 pounds per 1-hour drag. Average and maximum catches of other food-fish species, on a per drag basis, were: vermilion snapper (*Rhomboplites aurorubens*) 57 pounds average, 500 pounds maximum; white porgy (*Calamus* sp.) 100 pounds maximum; pink porgy (*Pagrus* sp.) 100 pounds maximum; and sea bass (*Centropristes striatus*) 20 pounds average and 150 pounds maximum. A 1,000-pound catch of spadefish (*Chaetodipterus faber*) was made in 25 to 27 fathoms east of Charleston.

Six drags with a 60/80-foot shrimp trawl in the 7- to 13-fathom depth range northeast of Charleston yielded only small numbers of skates and sharks.

A total of 9 stations were covered east of Cape Romain where modified crab-type and arrowhead fish traps were used in a depth range of 13 to 17 fathoms. Catches were generally small and ranged from 0 to 70 pounds of black sea bass per trap per 3-hour set. Small numbers of puffers (*Sphaeroides* sp.) and individual porgies were also occasionally taken.

Note: See Commercial Fisheries Review, April 1963 p. 25.



Sturgeon

SOVIETS USE NEW TYPE EQUIPMENT TO HATCH FRY ARTIFICIALLY:

The hatching of sturgeon fry by artificial methods was reported in the January 8, 1964, issue of Pressebureauet Novostis Bulletin, a mimeographed Danish-language Soviet period-

ical published in Copenhagen, Denmark. The freely translated English version from the Danish follows:

"Scientists and practical fish culturists have encountered great difficulties in research on artificial sturgeon culture. In nature, sturgeon roe is hatched while stuck to firm objects on the sea bottom. The stickiness of the roe makes artificial hatching difficult. Also there are no methods to combat a mold fungus that is parasitic on the eggs. When the eggs were washed with water containing mud particles, they lost their stickiness, but the development of the eggs and young was affected and the eggs often were destroyed. The fry from such eggs are smaller, not uniform in size and less capable of surviving than young bred under natural conditions.

"In the laboratory for vertebrate embryology of the Soviet Academy of Science's animal morphology institute, a trough incubator has been constructed after many years of examination of roes of different species of sturgeon. According to the new method the hatching takes place in sterile water. The water is sterilized by a bactericidal machine which, for the first time, is being used in practical fish culture. Spores of mold fungus die while passing through the machine when exposed to the influence of ultraviolet rays.

"The trough incubator is simple and cheap and the most compact and spacious of all hatching equipment. Within a volume of about 1-1/2 cubic meters it holds almost 17 kilos of sturgeon roe. It uses a minimum of water, approximately 18 cc. per second per kilo of roe. In the trough incubator an optimal change of air takes place and physical damage to eggs and young is practically out of the question. It insures the best possible development of the fry at all stages and a higher rate of survival. The trough incubator renders superfluous some technical processes--washing the roe and handling the fry. Further, it simplifies transportation of the fry to planting areas and thereby curtails expenses. Tests made by the test center for sturgeon culture in Kurinsk have confirmed the practical value of the incubator." (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 22, 1964.)

Tennessee Valley Authority

COMMERCIAL AND SPORT FISH CATCHES, 1963:

The 1963 commercial fish catch in the Tennessee Valley Authority (TVA) water complex and impoundments was about 5.6 million pounds with a market value of some \$2 million. The catch by sports fishermen amounted to more than 16 million pounds and involved expenditures by the anglers of some \$41 million.

In 1963, TVA and State agencies continued studies to increase the value of fish and wildlife resources. The TVA organized a large-scale study and investigation in mid-1963 aimed at rebuilding and maintaining Tennessee River mussel beds. The average annual Tennessee River mussel harvest of 10,000 tons between 1945-1955 declined drastically in 1962--down to only 4,700 short tons.

Note: See Commercial Fisheries Review, October 1963 p. 27.

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RESERVOIRS OFFER LARGER COMMERCIAL FISH HARVEST:

In an effort to increase the commercial fish harvest in Tennessee Valley Authority reservoirs, TVA biologists are testing fishing gear and searching for industrial fish markets. The Chief of the agency's Fish and Wildlife Branch said that the present annual 3,000-ton harvest of "rough" fish from Tennessee Valley waters could be safely increased to 30,000 tons. "Our inventories of TVA reservoirs show a total 'rough'-fish population of about 61,000 tons. At present harvesting rates, much of this resource is going to waste."

He pointed out that there are about three pounds of "rough" fish in TVA lakes for every pound of game fish. "One of the best ways to increase the proportion of game fish is to make more of the desirable living space available to them by reducing the 'rough' fish," he said.

The nongame fish being harvested now are those desired by restaurants and fish markets--primarily catfish, drum, buffalo-fish, carp, and paddlefish. Other species such as gar, redbreast, and suckers have little or no demand in those markets and are not harvested. However, livestock and pet feed manufacturers and fertilizer producers offer a market for industrial fish if large enough quantities are available and dependable sources of supply are developed. Since this will require more efficient fishing gear, TVA and state agencies are investigating purse seines, trawls, trap nets, and other equipment that has not previously been used in the Tennessee Valley.

A commercial fisherman is testing a mile-long haul seine under contract arrangements with the Tennessee Game and Fish Commission. So far, it has been tried in Melton Hill, Watts Bar, and Douglas reservoirs. While the harvest has not been spectacular, results have been promising enough to warrant further testing.

Haul seines are expected to be more effective in Melton Hill when fish in that new impoundment have attained commercial size. There was a large spawn of young fish in Melton Hill during 1963, and areas of clean bottom suitable for haul seines were prepared and precisely located before the reservoir was filled. Commercial-size trawls may also be productive in these cleared areas; purse seines could be used in open water to capture schooling fish such as shad.

It was pointed out that commercial fishing is regulated by the fish and game agencies of the various states. The states specify the types of fishing gear that can be used. Gear is selective and can be designed to take commercial fish almost exclusively. The Chief of the TVA Fish and Wildlife Branch said "Instead of fighting commercial fishermen, the sportsmen ought to join them and advocate a larger commercial harvest. There is just so much good living space for fish, and 'rough' fish will take it over in many places if they aren't controlled. The best way to control them is through commercial fishing."



U. S. Foreign Trade

AIRBORNE IMPORTS OF FISHERY PRODUCTS:

October 1963: Airborne fishery imports into the United States in October 1963 were down 12.6 percent in quantity and 5.2 percent in value from those in the previous month. Total airborne imports during January-October 1963 were almost the same as those in the same period of 1962.

Raw headless shrimp continued to make up the bulk of the airborne shrimp imports--in October 1963, shipments consisted of 335,656 pounds of fresh or frozen raw headless, 7,250 pounds of frozen raw peeled, and 37,033 pounds of unclassified shrimp. Over 92 percent of the airborne shrimp arrivals in October entered through the U. S. Customs District of Florida. The remainder entered through the Customs Districts of New Orleans (La.), Laredo (Tex.), and Los Angeles (Calif.).

| Product and Origin 2/ | 1963 | | 1963 | | 1962 | |
|--|--------------|--------------|----------------|----------------|----------------|----------------|
| | October | | Jan.-Oct. | | Jan.-Oct. | |
| | Qty. 3/ | Value 4/ | Qty. 3/ | Value 4/ | Qty. 3/ | Value 4/ |
| | 1,000 Lbs. | US\$ 1,000 | 1,000 Lbs. | US\$ 1,000 | 1,000 Lbs. | US\$ 1,000 |
| Fish: | | | | | | |
| Mexico | 19.6 | 2.5 | 245.2 | 66.4 | 811.0 | 140.8 |
| British Honduras | 2.9 | 0.5 | 41.7 | 10.2 | 19.4 | 4.8 |
| Honduras | - | - | 16.5 | 4.3 | 0.4 | 0.1 |
| Japan | - | - | 2.0 | 8.2 | - | - |
| United Kingdom | 0.9 | 1.5 | 3.1 | 6.7 | - | - |
| Iran | - | - | 1.2 | 7.4 | 8.1 | 84.2 |
| France | - | - | 5.2 | 6.1 | 0.3 | 0.7 |
| Rumania | - | - | - | - | 1.3 | 11.3 |
| Panama | - | - | 0.9 | 0.4 | 7.8 | 1.3 |
| U.S.S.R. | - | - | 26.8 | 70.2 | - | - |
| Canada | - | - | - | - | 21.3 | 16.9 |
| Costa Rica | - | - | - | - | 5.6 | 0.9 |
| Other countries | 2.7 | 0.6 | 3.5 | 0.9 | 38.8 | 12.1 |
| Total Fish | 26.1 | 5.1 | 346.1 | 180.8 | 914.0 | 273.1 |
| Shrimp: | | | | | | |
| Guatemala | - | - | 141.6 | 74.0 | 261.7 | 130.8 |
| El Salvador | 24.4 | 15.6 | 258.0 | 172.7 | 545.2 | 341.7 |
| Honduras | - | - | 99.8 | 52.3 | 25.2 | 18.6 |
| Nicaragua | 28.5 | 17.0 | 477.2 | 159.1 | 989.9 | 335.9 |
| Costa Rica | 72.7 | 36.1 | 582.5 | 278.9 | 498.8 | 213.2 |
| Panama | 91.8 | 53.7 | 1,442.5 | 776.2 | 1,653.5 | 919.4 |
| Venezuela | 162.5 | 78.5 | 4,161.9 | 1,956.1 | 2,884.9 | 1,557.3 |
| Ecuador | - | - | 111.6 | 39.4 | 12.2 | 3.4 |
| France | - | - | 2.6 | 0.9 | - | - |
| Mexico | - | - | 13.2 | 6.9 | 24.8 | 9.1 |
| Netherlands Antilles | - | - | - | - | 3.1 | 2.7 |
| Argentina | - | - | - | - | 10.5 | 4.8 |
| Total Shrimp | 379.9 | 200.9 | 7,290.9 | 3,516.5 | 6,909.8 | 3,536.9 |
| Shellfish other than Shrimp: | | | | | | |
| Mexico | 5.4 | 4.1 | 97.6 | 57.6 | 68.3 | 45.1 |
| British Honduras | 63.1 | 54.1 | 309.9 | 253.7 | 206.6 | 121.0 |
| El Salvador | - | - | 5.0 | 3.6 | 6.2 | 4.6 |
| Honduras | 11.5 | 3.7 | 17.0 | 7.0 | 139.7 | 103.4 |
| Nicaragua | 18.6 | 11.0 | 164.5 | 100.0 | 1.2 | 0.6 |
| Costa Rica | - | - | 73.8 | 60.1 | 1.4 | 1.2 |
| Jamaica | 14.7 | 9.4 | 65.7 | 49.5 | 30.0 | 21.3 |
| Netherlands Antilles | - | - | 32.8 | 20.9 | 43.1 | 28.5 |
| Colombia | - | - | 8.0 | 21.7 | 1.8 | 5.1 |
| Ecuador | - | - | 2.2 | 1.8 | 1.6 | 1.2 |
| Tunisia | - | - | 0.8 | 0.9 | - | - |
| Leeward and Windward Islands | - | - | 1.6 | 0.5 | 24.0 | 9.1 |
| British Guiana | - | - | 1.7 | 0.3 | - | - |
| Canada | - | - | 213.3 | 109.2 | 224.1 | 91.1 |
| Venezuela | - | - | 13.7 | 6.0 | 22.3 | 13.6 |
| Panama | 0.4 | 0.4 | 3.1 | 2.6 | 1.0 | 1.0 |
| Guatemala | - | - | - | - | 11.5 | 5.7 |
| Bahamas | - | - | 5.3 | 5.2 | 17.8 | 6.5 |
| Dominican Republic | 3.1 | 2.9 | 25.3 | 23.8 | 25.6 | 23.7 |
| Yugoslavia | - | - | - | 0.7 | - | - |
| Trinidad | - | - | - | - | 2.3 | 1.0 |
| Other countries | - | - | 2.0 | 2.9 | 1.1 | 2.2 |
| Total Shellfish (except shrimp) | 116.8 | 85.6 | 1,044.5 | 728.0 | 829.6 | 485.9 |
| Grand Total | 522.8 | 291.6 | 8,681.5 | 4,425.3 | 8,653.4 | 4,295.9 |

Airborne imports of shellfish other than shrimp in October consisted mainly of 105,974 pounds of fresh or frozen spiny lobster products. Almost 95 percent of the airborne imports of spiny lobsters entered through the Customs District of Florida. The remainder entered through the Customs Districts of New York (N.Y.), and South Carolina.

Fish fillets from Mexico were the leading finfish product imported by air in October.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of

the airborne imports consists of fresh and frozen products. (United States Airborne General Imports of Merchandise, FT 380, October 1963, U. S. Bureau of Census.)

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September 1963: Airborne fishery imports into the United States in September 1963 were down 51.6 percent in quantity and 48.0 percent in value from those in the previous month. Total airborne imports during January-September 1963 showed an increase of 9.5 percent in quantity and 15.2 percent in value from

| Product and Origin 2/ | 1963 | | 1963 | | 1962 | |
|--|--------------|--------------|----------------|----------------|----------------|----------------|
| | September | | Jan.-Sept. | | Jan.-Sept. | |
| | Qty. 3/ | Value 4/ | Qty. 3/ | Value 4/ | Qty. 3/ | Value 4/ |
| | 1,000 Lbs. | US\$ 1,000 | 1,000 Lbs. | US\$ 1,000 | 1,000 Lbs. | US\$ 1,000 |
| Fish: | | | | | | |
| Mexico | 30.5 | 7.1 | 225.6 | 63.9 | 691.5 | 121.4 |
| British Honduras | 1.1 | 0.2 | 38.8 | 9.7 | 14.7 | 3.7 |
| Honduras | - | - | 16.5 | 4.3 | - | - |
| Japan | - | - | 2.0 | 8.2 | - | - |
| United Kingdom | 0.4 | 0.7 | 2.2 | 5.2 | - | - |
| Iran | - | - | 1.2 | 7.4 | - | - |
| France | - | - | 5.2 | 6.1 | 0.3 | 0.7 |
| Rumania | - | - | - | - | 1.3 | 11.3 |
| Panama | - | - | 0.9 | 0.4 | 7.8 | 1.3 |
| U.S.S.R. | - | - | 26.8 | 70.2 | - | - |
| Canada | - | - | - | - | 21.3 | 16.9 |
| Costa Rica | - | - | - | - | 5.6 | 0.9 |
| Other countries | - | - | 0.8 | 0.3 | 38.1 | 9.9 |
| Total Fish | 32.0 | 8.0 | 320.0 | 175.7 | 780.6 | 166.1 |
| Shrimp: | | | | | | |
| Guatemala | - | - | 141.6 | 74.0 | 230.2 | 115.3 |
| El Salvador | 12.0 | 6.5 | 233.6 | 157.1 | 467.1 | 292.8 |
| Honduras | - | - | 99.8 | 52.3 | - | - |
| Nicaragua | 22.7 | 6.6 | 448.7 | 142.1 | 979.9 | 330.2 |
| Costa Rica | 54.8 | 25.6 | 509.8 | 242.8 | 327.7 | 138.8 |
| Panama | 133.0 | 75.3 | 1,350.7 | 722.5 | 1,423.2 | 776.3 |
| Venezuela | 269.1 | 128.3 | 3,999.4 | 1,877.6 | 2,482.4 | 1,343.4 |
| Ecuador | - | - | 111.6 | 39.4 | 12.2 | 3.4 |
| France | - | - | 2.6 | 0.9 | - | - |
| Mexico | - | - | 13.2 | 6.9 | 24.7 | 9.1 |
| Netherlands Antilles | - | - | - | - | 3.1 | 2.7 |
| Total Shrimp | 491.6 | 242.3 | 6,911.0 | 3,315.6 | 5,950.5 | 3,012.0 |
| Shellfish other than Shrimp: | | | | | | |
| Mexico | 2.2 | 0.8 | 92.2 | 53.5 | 53.9 | 33.6 |
| British Honduras | 44.6 | 38.0 | 246.8 | 199.6 | 177.2 | 102.3 |
| El Salvador | - | - | 5.0 | 3.6 | 0.8 | 0.5 |
| Honduras | 3.6 | 2.3 | 5.5 | 3.3 | 113.0 | 80.7 |
| Nicaragua | 17.7 | 10.0 | 145.9 | 89.0 | 1.2 | 0.6 |
| Costa Rica | - | - | 73.8 | 60.1 | 1.4 | 1.2 |
| Jamaica | - | - | 51.0 | 40.1 | 30.0 | 21.3 |
| Netherlands Antilles | - | - | 32.8 | 20.9 | 31.2 | 19.9 |
| Colombia | - | - | 8.0 | 21.7 | 1.8 | 5.1 |
| Ecuador | - | - | 2.2 | 1.8 | 1.6 | 1.1 |
| Tunisia | - | - | 0.8 | 0.9 | - | - |
| Leeward and Windward Islands | - | - | 1.6 | 0.5 | 22.9 | 8.7 |
| British Guiana | - | - | 1.7 | 0.3 | - | - |
| Canada | - | - | 213.3 | 109.2 | 223.4 | 90.9 |
| Venezuela | - | - | 13.7 | 6.0 | 22.3 | 13.6 |
| Panama | 1.2 | 1.0 | 2.7 | 2.2 | 1.0 | 1.0 |
| Guatemala | - | - | - | - | 8.5 | 4.6 |
| Bahamas | 5.3 | 5.2 | 5.3 | 5.2 | 1.9 | 0.8 |
| Dominican Republic | - | - | 22.2 | 20.9 | 22.1 | 20.2 |
| Yugoslavia | - | - | 1.2 | 0.7 | - | - |
| Trinidad | - | - | - | - | 2.3 | 1.0 |
| Other countries | - | - | 2.0 | 2.9 | 0.5 | 1.5 |
| Total Shellfish (except shrimp) | 74.6 | 57.3 | 927.7 | 642.4 | 717.0 | 408.6 |
| Grand Total | 598.2 | 307.6 | 8,158.7 | 4,133.7 | 7,448.1 | 3,586.7 |

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.
 2/When the country of origin is not known, the country of shipment is shown.
 3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.
 4/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.
 Note: These data are included in the over-all import figures for total imports, i.e., these imports are not to be added to other import data published.

arrivals in the same period of 1962, due mainly to larger shipments of shrimp and spiny lobsters.

Raw headless shrimp continued to make up the bulk of the airborne shrimp imports--in September 1963, shipments consisted of 470,027 pounds of fresh or frozen raw headless, 11,580 pounds of frozen raw peeled and deveined, and 9,952 pounds of unclassified shrimp. All of the airborne shrimp arrivals in September entered through the U. S. Customs District of Florida.

Airborne imports of shellfish other than shrimp in September consisted of 72,385 pounds of fresh or frozen spiny lobster products which entered through the Customs District of Florida, and 2,200 pounds of oysters which entered through the Customs District of Laredo (Tex.).

Airborne imports of finfish in September consisted of fresh or frozen fish and fish fillets from Mexico and British Honduras.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products. (United States Airborne General Imports of Merchandise, FT 380, September 1963, U. S. Bureau of Census.)

IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-December 31, 1963, amounted to 56,413,638 pounds (about 2,686,364 std. cases), according to preliminary data compiled by the Bureau of Customs. This was 6,717,004 pounds (319,857 std. cases) less than the quota. But the imports in 1963 were 3.5 percent above the 54,483,996 pounds (about 2,594,476 std. cases) imported during 1962.

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1963 at the 12½-percent rate of duty was limited to 63,130,642 pounds (or about 3,006,221 std. cases of 48 7-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

IMPORTS OF FISH MEAL AND SCRAP BY CUSTOMS DISTRICTS:

December 1963: U. S. imports of fish meal and scrap in December 1963 totaled 29,729 short tons, an increase of 71.2 percent from the 17,369 tons imported in the previous month, and up 56.7 percent from the 18,977 tons imported in December 1962.

About 89.3 percent of the fish meal and scrap imports in December 1963 entered through the Customs Districts of Maryland, Georgia, Mobile (Ala.), Galveston (Tex.), San Francisco (Calif.), Los Angeles (Calif.), and Washington.

| U. S. Imports of Fish Meal and Scrap by Customs District, December 1963 | |
|---|---------------|
| Customs Districts | December 1963 |
| | Short Tons |
| Maine & New Hampshire | 500 |
| Massachusetts | 67 |
| New York (N. Y.) | 242 |
| Philadelphia (Pa.) | 222 |
| Maryland | 7,074 |
| North Carolina | 331 |
| Georgia | 3,351 |
| Florida | 548 |
| Mobile (Ala.) | 6,335 |
| Sabine (Tex.) | 557 |
| Galveston (Tex.) | 2,328 |
| Los Angeles (Calif.) | 1,187 |
| San Francisco (Calif.) | 3,129 |
| Oregon | 110 |
| Washington | 3,136 |
| Duluth (Minn.) and Superior (Wis.) | 550 |
| Michigan | 62 |
| Total | 29,729 |

Note: A list of the entry ports included within each Customs District is given in Schedule D, Code Classification of United States Customs Districts and Ports, which may be obtained free from the Foreign Trade Division, Bureau of the Census, U. S. Department of Commerce, Washington, D. C., 20233.

November 1963: United States imports of fish meal and scrap in November 1963 totaled 17,369 short tons, a decline of 44.8 percent from the 31,449 tons imported in the previous month, but a considerable increase from the 11,904 tons imported in November 1962.

About 80.4 percent of the fish meal and scrap imports in November 1963 entered through the Customs Districts of North Caro-

| U. S. Imports of Fish Meal and Scrap by Customs Districts, November 1963 | |
|--|---------------|
| Customs Districts | November 1963 |
| | Short Tons |
| Maine & New Hampshire | 679 |
| Massachusetts | 72 |
| New York (N. Y.) | 129 |
| Maryland | 882 |
| North Carolina | 1,433 |
| Mobile (Ala.) | 1,314 |
| New Orleans (La.) | 1,540 |
| Galveston (Tex.) | 4,159 |
| Los Angeles (Calif.) | 330 |
| San Francisco (Calif.) | 3,154 |
| Oregon | 343 |
| Washington | 2,360 |
| Hawaii | 100 |
| Dakota | 210 |
| Duluth (Minn.) and Superior (Wis.) | 263 |
| Michigan | 401 |
| Total | 17,369 |

Note: A list of the entry ports included within each Customs District is given in Schedule D, Code Classification of United States Customs Districts and Ports, which may be obtained free from the Foreign Trade Division, Bureau of the Census, U. S. Department of Commerce, Washington, D. C., 20233.

lina, New Orleans (La.), Mobile (Ala.), Galveston (Tex.), San Francisco (Calif.), and Washington.

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EDIBLE FISHERY PRODUCTS:

November 1963: Imports of processed edible fish and shellfish into the United States in November 1963 were down 2.3 percent in quantity and 6.9 percent in value from those in the previous month. Imports of most fish fillets were down in November and shipments of canned sardines also declined. There was a gain in imports of canned tuna in brine and canned oysters.

Compared with the same month in 1962, the imports in November 1963 were down 2.6 percent in quantity and 4.5 percent in value. In November 1963, there were lower imports of canned sardines in oil, haddock fillets, halibut fillets, swordfish fillets, and sea catfish (wolffish) fillets. The decline was almost offset by larger imports of ocean perch fillets, canned tuna in brine, and canned oysters.

In the first 11 months of 1963, imports were down 3.6 percent in quantity and 3.4 percent in value. Fluctuations in individual import items were much greater than the over-all totals indicate. Imports were down sharply in 1963 for canned tuna in brine, canned sardines in oil, and canned salmon. Imports were also down for flounder fillets, halibut fillets, sea catfish fillets, and swordfish fillets. On the other hand, there was an increase in imports of canned sardines not-in-oil (mostly from South Africa Republic), ocean perch fillets, blocks and slabs, canned crab meat from Japan, and yellow pike fillets.

Exports of processed fish and shellfish from the United States in November 1963 were up 5.7 percent in quantity but down 14.3 percent in value from those in the previous month. The gain in volume was concentrated in the lower-priced canned mackerel and canned sardines while exports of the higher-priced canned salmon and canned shrimp declined.

Compared with the same month in 1962, November 1963 exports were up 5.7 percent in quantity but down 10.0 percent in value. Again, there were larger shipments of lower-priced canned fishery products but a drop in exports of the more expensive items.

Processed fish and shellfish exports in the first 11 months of 1963 were down 2.3 percent in quantity but up 4.3 percent in value from those in the same period in 1962. The decline in quantity was due mainly to lower shipments of canned sardines and a drop in exports of canned mackerel to the Congo Republic. There were increases in exports of the higher-priced canned salmon and canned shrimp, as well as larger shipments of canned squid. Although not covered in the table, exports of frozen shrimp were up sharply in the first 11 months of 1963 (increase mostly in exports to Japan), and there was a substantial increase in exports of frozen salmon.

* * * * *

October 1963: Imports of processed edible fish and shellfish into the United States in October 1963 were up 16.0 percent in quantity and 18.7 percent in value from those in the previous month. There was a general increase in imports of fish fillets as well as canned fishery products (with the exception of canned albacore tuna in brine).

Compared with the same month in 1962, imports in October 1963 were down 1.1 percent in quantity but up 3.9 percent in value.

In October 1963, there were larger imports of cod fillets, haddock fillets, yellow pike fil-

| Item | QUANTITY | | | | VALUE | | | |
|------------------------------|--------------------------|------|-----------|-------|------------------------|------|-----------|-------|
| | Nov. | | Jan.-Nov. | | Nov. | | Jan.-Nov. | |
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| | .. (Millions of Lbs.) .. | | | | .. (Millions of \$) .. | | | |
| Fish & Shellfish: | | | | | | | | |
| Imports ^{1/} . . . | 51.8 | 53.2 | 492.4 | 510.7 | 14.8 | 15.5 | 143.7 | 148.8 |
| Exports ^{2/} . . . | 3.7 | 3.5 | 30.1 | 30.8 | 1.8 | 2.0 | 14.5 | 13.9 |

^{1/}Includes only those fishery products classified by the U. S. Bureau of the Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i. e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

^{2/}Excludes fresh and frozen.

| Item | QUANTITY | | | | VALUE | | | |
|------------------------------|--------------------------|------|-----------|-------|------------------------|------|-----------|-------|
| | Oct. | | Jan.-Oct. | | Oct. | | Jan.-Oct. | |
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| | .. (Millions of Lbs.) .. | | | | .. (Millions of \$) .. | | | |
| Fish & Shellfish: | | | | | | | | |
| Imports ^{1/} . . . | 53.0 | 53.6 | 440.6 | 457.5 | 15.9 | 15.3 | 128.9 | 133.3 |
| Exports ^{2/} . . . | 3.5 | 3.6 | 26.4 | 27.3 | 2.1 | 2.0 | 12.7 | 11.9 |

Note: For explanation of footnotes see table for November.

lets, canned sardines in oil, and canned crab meat. The gain was offset by a drop in imports of halibut fillets, canned tuna in brine, and canned sardines not-in-oil.

In the first 10 months of 1963, imports were down 3.7 percent in quantity and 3.3 percent in value. Fluctuations in individual import items were much greater than the overall totals indicate. Imports were down sharply in 1963 for canned tuna in brine, canned sardines in oil, and canned salmon. On the other hand, there was a large increase in imports of canned sardines not-in-oil (mostly from South Africa Republic); fish blocks and slabs, and canned crab meat from Japan.

Exports of processed fish and shellfish from the United States in October 1963 were down 2.8 percent in quantity but up 5.0 percent in value from those in the same month of 1962. Lower shipments of canned squid and canned sardines were about offset by larger exports of canned salmon, canned shrimp, and canned mackerel.

Processed fish and shellfish exports in the first 10 months of 1963 were down 3.3 percent in quantity but up 6.7 percent in value from those in the same period in 1962. The decline in quantity was due mainly to lower shipments of canned sardines and a drop in exports of canned mackerel to the Congo Republic. There were increases in exports of the higher-priced canned salmon and canned shrimp, as well as larger shipments of canned squid. Although not covered in the table, exports of frozen shrimp were up sharply in the first 10 months of 1963 (increase mostly in exports to Japan), and there was a substantial increase in exports of frozen salmon.

Notes: (1) The data shown above were previously included in news releases on "U. S. Imports and Exports of Edible Fishery Products." In the past, data showing "U. S. Imports of Edible Fishery Products" summarized both manufactured and crude products. At present, a monthly summary of U. S. imports of crude or non-processed fishery products is not available, therefore only imports of manufactured or processed edible fishery products are reported above. The above import data are, therefore, not comparable to previous reports of "U. S. Imports of Edible Fishery Products."

The export data shown above are comparable to previous data in "U. S. Exports of Edible Fishery Products." The export data in this series of articles have always been limited to manufactured or processed products.

(2) See Commercial Fisheries Review, Jan. 1964 p. 34, Nov. 1963 p. 49.



U. S. Vessels

NEW RESEARCH VESSEL COMMISSIONED FOR BUREAU OF COMMERCIAL FISHERIES:

The Townsend Cromwell, the new oceanographic and fisheries research vessel of the U. S. Bureau of Commercial Fisheries, was commissioned January 25, 1964, at Honolulu, Hawaii. The new vessel is named in honor of an oceanographer who discovered in 1951 a major Pacific Ocean current which now carries his name. The Townsend Cromwell is designed to provide the range, seaworthiness, and laboratory facilities needed for applying a variety of research techniques to the study of fishery resources and their oceanographic environment over a vast area of the central Pacific. The vessel was built in Louisiana at a cost of \$1,700,000.



Figure 1 - Townsend Cromwell viewed from the side.

In appearance, the Townsend Cromwell, a 158-foot vessel of 565 gross tons, is similar to a modern distant-water trawler. Its fishing capabilities emphasize midwater trawling and long-line fishing, but it can be adapted to other types of net and line fishing.

Hydrographic, biological, and chemical laboratories are centrally located on the main deck in a position of minimum motion near the overside work platform.

To maintain the slow speeds necessary for plankton investigations and gain the maneuverability needed at oceanographic stations, twin screws, variable pitch propellers, and twin spade rudders have been installed. Two 400-horsepower Diesel engines drive the vessel at a cruising speed of 12 knots. Electric power is supplied by three 60-kilowatt Diesel generators. The vessel has a range of about 10,000 miles and will be able to cruise up to 2 months without refueling. Her complement of 25 men will include 7 scientists.

The vessel is designed to enable scientists to continue their work during rough weather. There are anti-roll features and a bulbous nose under the bow which will dampen pitching from fore to aft. The bulbous nose also will serve as a viewing chamber to permit observations and photographs of marine specimens underwater. The high transparency of the tropical Pacific in daylight permits visibility for several hundred feet.

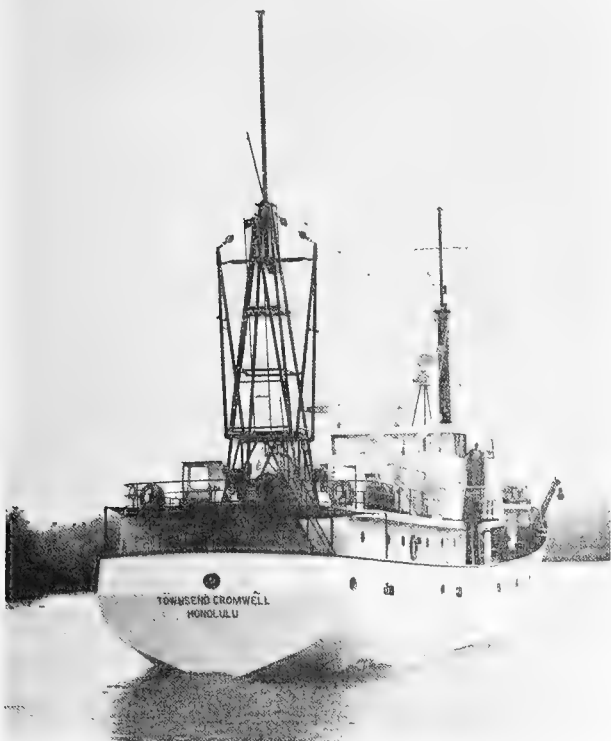


Figure 2 - Townsend Cromwell viewed from the stern.

The Hawaiian Area Director of the U. S. Bureau of Commercial Fisheries said that the vessel will engage in oceanographic studies and in experimental fishing to learn more of the basic processes in the ocean and to find new areas where fish may be caught, particularly tuna.

Beginning in the early summer of 1965, the Bureau of Commercial Fisheries will use the vessel to participate with other Government agencies in the Pacific Trade Wind Zone Oceanographic Program, a planned two-year cooperative study in a rectangular area of the Pacific roughly the size of the United States.

The study is expected to provide information on interactions between the atmosphere and the ocean that affect our climate and even the distribution of fish. One phase of the research will try to determine how weather is affected when the ocean absorbs heat in one part of the world and transports it to another.



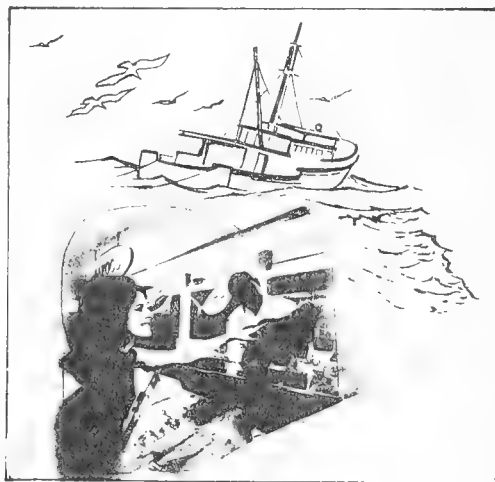
Wholesale Prices

EDIBLE FISH AND SHELLFISH, JANUARY 1964:

The wholesale price index for edible fish and shellfish (fresh, frozen, and canned) rose steadily each month from November 1963 to January 1964. At 110.0 percent of the 1957-59 average, the index in January 1964 was up 2.3 percent from the previous month. Compared with January 1963, prices this January were down substantially for nearly all items with the over-all index down 9.8 percent.

The subgroup index for drawn, dressed, or whole finfish was up 1.8 percent from December to January 1964, but was lower than January a year earlier by 15.1 percent. Prices at Boston for ex-vessel large haddock (up 6.0 percent) moved up from December to January because of lighter landings, but were 13.4 percent below January 1963. A substantial increase from the previous month in prices for fresh Lake Superior whitefish (up 13.4 percent) at Chicago was partly offset by lower prices for Great Lakes round yellow pike at New York City. Prices at New York City for frozen dressed western halibut and king salmon this January were the same as in the previous month but were considerably lower than in January 1963 because of large stocks in cold storage.

Higher January 1964 prices for all processed fresh fish and shellfish products were responsible for a 3.5-percent increase from the previous month in that subgroup index. Prices for South Atlantic fresh shrimp at New York City were up 5.5 percent from December to January, but down 20.8 percent from January 1963. Fresh small haddock fillets at Boston were higher-priced (up 2.6 percent) this January than the previous month, and were up 3.5 percent from the same month a year earlier. Compared with January 1963, the subgroup index this January was 11.5-percent lower mainly because of sharply lower fresh shrimp prices and some decline in prices for standard shucked oysters at Norfolk.



| Wholesale Average Prices and Indexes for Edible Fish and Shellfish, January 1964 with Comparisons | | | | | | | | |
|---|------------------|------|---------------------|-----------|-----------------------|-----------|-----------|-----------|
| Group, Subgroup, and Item Specification | Point of Pricing | Unit | Avg. Prices 1/ (\$) | | Indexes (1957-59=100) | | | |
| | | | Jan. 1964 | Dec. 1963 | Jan. 1964 | Dec. 1963 | Nov. 1963 | Jan. 1963 |
| ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) | | | | | 110.0 | 107.5 | 106.1 | 121.9 |
| Fresh & Frozen Fishery Products: | | | | | 113.0 | 110.5 | 109.0 | 130.0 |
| Drawn, Dressed, or Whole Finfish: | | | | | 116.5 | 114.4 | 117.0 | 137.2 |
| Haddock, lge., offshore, drawn, fresh | Boston | lb. | .18 | .17 | 141.0 | 133.0 | 124.7 | 162.9 |
| Halibut, West., 20/80 lbs., drsd., fresh or froz. | New York | lb. | .33 | .33 | 96.1 | 96.1 | 97.1 | 128.1 |
| Salmon, king, lge. & med., drsd., fresh or froz. | New York | lb. | .85 | .85 | 118.4 | 2/118.4 | 124.0 | 134.5 |
| Whitefish, L. Superior, drawn, fresh | Chicago | lb. | .47 | .41 | 69.4 | 61.2 | 83.6 | 106.0 |
| Yellow pike, L. Michigan & Huron, rnd., fresh | New York | lb. | .49 | .51 | 80.2 | 83.5 | 75.3 | 88.5 |
| Processed, Fresh (Fish & Shellfish): | | | | | 115.4 | 111.5 | 107.2 | 130.4 |
| Filletts, haddock, sml., skins on, 20-lb. tins | Boston | lb. | .59 | .57 | 142.0 | 2/138.4 | 131.1 | 137.2 |
| Shrimp, lge. (26-30 count), headless, fresh | New York | lb. | .86 | .82 | 100.8 | 95.5 | 85.0 | 127.2 |
| Oysters, shucked, standards | Norfolk | gal. | 7.63 | 7.50 | 128.6 | 126.5 | 130.7 | 132.8 |
| Processed, Frozen (Fish & Shellfish): | | | | | 102.8 | 101.3 | 98.6 | 117.5 |
| Filletts: Flounder, skinless, 1-lb. pkg. | Boston | lb. | .39 | .39 | 98.9 | 98.9 | 98.9 | 100.1 |
| Haddock, sml., skins on, 1-lb. pkg. | Boston | lb. | .39 | .40 | 114.3 | 115.8 | 111.4 | 107.0 |
| Ocean perch, lge., skins on 1-lb. pkg. | Boston | lb. | .34 | .35 | 117.5 | 121.0 | 119.2 | 117.5 |
| Shrimp, lge. (26-30 count), brown, 5-lb. pkg. | Chicago | lb. | .81 | .78 | 95.5 | 91.9 | 89.5 | 123.9 |
| Canned Fishery Products: | | | | | 104.7 | 102.5 | 101.2 | 108.0 |
| Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. | Seattle | cs. | 23.50 | 23.50 | 102.4 | 102.4 | 101.3 | 107.9 |
| Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. | Los Angeles | cs. | 11.63 | 11.06 | 103.3 | 98.2 | 96.6 | 104.4 |
| Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs. | Los Angeles | cs. | 5.75 | 5.75 | 97.5 | 97.5 | 97.5 | 3/100.0 |
| Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. | New York | cs. | 8.96 | 8.96 | 114.9 | 114.9 | 113.3 | 119.4 |

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/Revised.

3/New product replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.

The subgroup index for processed frozen fish and shellfish rose 1.5 percent from December to January due to higher prices at Chicago for frozen shrimp (wholesale price up 3 cents a pound). Prices for frozen haddock and ocean perch fillets were slightly lower than in December, and flounder fillet prices were unchanged from those of the previous month. The January 1964 subgroup index was down 12.5 percent from the same month a year earlier largely because of lower frozen shrimp prices. But prices for frozen haddock fillets this January were up 6.8 percent from January 1963.

Although prices for most canned fish products were relatively unchanged from December to January, those for canned tuna moved up 5.2 percent and were solely responsible for a 2.1-percent increase in that subgroup index for January 1964. The California canned tuna pack for 1963 of 9 million cases was about 1.5 million cases below the 1962 pack. As compared with January 1963, prices this January were lower for all canned fish and that subgroup index was down 3.1 percent.



Yellow Pike

INCREASE PREDICTED OF COMMERCIAL LANDINGS IN LAKE ERIE:

A greatly increased commercial catch of yellow pike (walleyes) in western Lake Erie,

based on fish developing from a highly successful spawning in the spring of 1962, has been predicted by Ontario's Department of Lands and Forests, Canada. This should mean that sport fishing for that species will also be much better. Down from record-high landings in 1956 of 9,275,000 pounds to a record low of 269,000 pounds in 1961, the catch prediction for 1964 is between 1 and 1¼ million pounds.

An abundance of young yellow pike resulting from the unusually successful 1962 hatch, coupled with much faster growth, led to the prediction. The Ontario Government agency noted that an accelerated rate of growth also seems to be matched by an accelerated development of sexual activity. As a result, males appear likely to reach breeding maturity at 2 years of age and females at 3 years, whereas the more usual ages are 3 for males and 4 for females.





International

EUROPEAN FREE TRADE ASSOCIATION

INDUSTRIAL TARIFFS REDUCED ANOTHER 10 PERCENT:

On December 31, 1963, the European Free Trade Association (EFTA) announced a further cut of 10 percent in the level of tariffs on industrial goods traded between the 7 member countries of the Association (Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom) and between them and Finland, as associate member of EFTA. But fishery and agricultural products are not included in the industrial goods category. This brings the 1964 level of industrial tariffs within EFTA to 40 percent of what it was on January 1, 1960. Successive accelerations of the timetable for the reduction of industrial tariffs, including new decisions of the EFTA Council of Ministers in Lisbon in May 1963, have brought EFTA to the 40 percent level 2 years earlier than the original timetable laid down in the 1960 Stockholm Convention.

The 1963 Lisbon meeting also ruled that the industrial tariffs within EFTA should be reduced to zero by December 31, 1966, three years earlier than the original timetable. (European Free Trade Association Reporter, January 23, 1964.)

Note: See Commercial Fisheries Review, October 1963 p. 39.

FISHING LIMITS

MODIFIED 12-MILE FISHING LIMIT PROPOSED AT EUROPEAN FISHERIES CONFERENCE IN LONDON:

A majority of the 16 nations, attending the European Fisheries Conference in London during January 1964, approved a draft agreement calling for a modified 12-mile offshore fishing limit. The draft agreement provides for a 6-mile exclusive fishery limit and an additional 6-mile belt in which countries with

"traditional fishing rights" will be permitted to continue to fish.

A conference communique did not name the countries opposed to the agreement.

Countries attending the conference were Austria, Belgium, Denmark, France, Germany, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

The conference expected to reconvene on February 16. (European Free Trade Association Reporter, January 23, 1964.)

Note: See Commercial Fisheries Review, February 1964 p. 59.

FISH MEAL

PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-OCTOBER 1963:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Angola, Iceland, Norway, Peru, and South Africa/South-West Africa. Exports of fish meal by FEO countries during January-October 1963 were up 10.9 percent and their production was up 8.1 percent in quantity from that in the same period of the previous year.

Table 1 - Exports of Fish Meal by Member Countries of the FEO, January-October 1963

| Country | July | | Aug. | | Sept. | | Oct. | | Jan.-Oct. | |
|---------------------------------|-------|-------|-------|-------|-------|------|-------|------|-----------|---------|
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Metric Tons) | | | | | | | | | | |
| Angola . . . | 0.8 | 1.1 | 1.5 | 3.3 | 1.5 | 1.4 | 3.6 | 4.4 | 21.3 | 25.1 |
| Iceland . . . | 7.6 | 2.9 | 5.7 | 10.9 | 6.1 | 4.3 | 10.2 | 2.4 | 66.8 | 58.9 |
| Norway . . . | 3.9 | 3.3 | 5.4 | 4.2 | 5.6 | 3.6 | 12.1 | 6.8 | 68.6 | 41.0 |
| Peru | 110.3 | 95.4 | 83.1 | 88.9 | 73.4 | 56.4 | 83.3 | 63.3 | 964.2 | 863.9 |
| So. Afr. (inc. S.W. Africa) | 17.5 | 16.9 | 15.6 | 14.7 | 20.2 | 10.2 | 41.0 | 10.3 | 166.7 | 172.1 |
| Total . . . | 140.1 | 119.6 | 111.3 | 122.0 | 106.8 | 75.9 | 150.2 | 87.2 | 1,287.6 | 1,161.0 |

Table 2 - Production of Fish Meal by Member Countries of the FEO, January-October 1963

| Country | July | | Aug. | | Sept. | | Oct. | | Jan.-Oct. | |
|---------------------------------|-------|-------|------|-------|-------|------|-------|-------|-----------|---------|
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Metric Tons) | | | | | | | | | | |
| Angola . . . | 1.1 | 1.2 | 2.0 | 3.1 | 1.3 | 1.2 | 3.6 | 4.8 | 21.0 | 24.7 |
| Iceland . . . | 6.3 | 19.1 | 18.2 | 29.2 | 13.3 | 11.8 | 0.9 | 0.4 | 78.3 | 92.9 |
| Norway . . . | 25.3 | 36.5 | 18.3 | 18.7 | 14.1 | 9.4 | 7.8 | 11.9 | 110.0 | 107.1 |
| Peru | 39.2 | 65.7 | 38.0 | 52.4 | 47.7 | 64.5 | 76.8 | 92.3 | 903.4 | 819.3 |
| So. Afr. (inc. S.W. Africa) | 29.2 | 22.1 | 19.3 | 11.7 | 20.8 | 6.5 | 17.0 | 2.6 | 233.2 | 200.5 |
| Total . . . | 101.1 | 144.6 | 95.8 | 115.1 | 97.2 | 93.4 | 106.1 | 112.0 | 1,345.9 | 1,244.5 |

International (Contd.):

During the first 10 months of 1963, Peru accounted for 74.9 percent of total fish meal exports by FEO countries, followed by South Africa with 12.9 percent, Norway with 5.3 percent, Iceland with 5.2 percent, and Angola with 1.7 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 22, 1964.)

FOOD AND AGRICULTURE ORGANIZATION

1962 WORLD FISH CATCH
BY SPECIES GROUPS:

The world fish catch in 1962 was 8.6 percent greater than in the previous year, according to The Yearbook of Fisheries Statistics published by the Food and Agriculture Organization (FAO) of the United Nations. Herring, sardine, and anchovy-type fish formed the largest group taken in 1962. The catch of that group was up 16.4 percent from

World Commercial Fish Catch^{1/} by Groups of Species, 1961-1962

| Groups of Species | 1962 | 1961 |
|---|-----------------------|--------------|
| | (Million Metric Tons) | |
| Fresh-water fish | 4.67 | 4.39 |
| Salmon, trout, smelt, etc. | 0.55 | 0.77 |
| Flounder, halibut, sole, and other flatfish | 1.21 | 1.31 |
| Cod, hake, haddock, etc. | 5.51 | 5.06 |
| Herring, sardine, anchovy, etc. | 14.66 | 12.59 |
| Tuna, bonito, mackerel, etc. | 2.38 | 2.11 |
| Mullet, jacks, seabass, etc. | 4.27 | 4.03 |
| Sharks, rays, etc. | 0.37 | 0.34 |
| Unsorted and unidentified fish | 6.95 | 6.68 |
| Crustaceans | 0.96 | 0.88 |
| Molluscs | 2.53 | 2.29 |
| Aquatic plants | 0.66 | 0.71 |
| Total | 44.72 | 41.16 |

^{1/}Live weight or whole fresh weight basis.

1961. The increase was a major factor in boosting world fish production to a record level in 1962. The only important species groups taken in lesser quantity in 1962 were flatfish (down 7.6 percent) and salmon, trout, smelt, etc. (down 28.6 percent).

* * * * *

WORLD TUNA-LIKE FISH CATCH, 1962:

A record world catch of 2,380,000 metric tons of tuna, bonito, mackerel, and other tuna-like fish was made during 1962, according to The Yearbook of Fisheries Statistics of the Food and Agriculture Organization (FAO) of the United Nations. The 1962 catch of those fish was up 13 percent from the previous year. The tuna, bonito, and mackerel group represented 5.3 percent of the 1962 world fish catch of 44.72 million tons.

Japan was the leading producer of tuna and tuna-like fish in 1962 with landings of 1,167,800 tons, just under one-half the world

total. Thus Japan improved on her own previous tuna-like catch record of 1,036,700 tons in 1961.

The United States was second with a 1962 tuna catch of 169,700 tons. That was a drop of 9,300 tons from the 179,000 tons caught in 1961.

Peru came third with a catch of 151,500 tons, topping the previous Peruvian high of 146,500 tons caught in 1961. Spain was fourth with 72,300 tons--29,400 tons above her 1961 catch, but still slightly below her record tuna catch of 73,500 tons in 1958.

The only other countries to catch over 50,000 tons of tuna or tuna-like fish in 1962 were China (Taiwan) with 65,700 tons, and India with 62,900.

* * * * *

DIRECTOR-GENERAL RE-ELECTED AT
NOVEMBER 1963 CONFERENCE:

B. R. Sen of India was re-elected on November 27, 1963, to serve as Director-General of the Food and Agriculture Organization (FAO) until the end of 1967. He was first elected Director-General in September 1956, following the resignation of Dr. Philip Cardon of the United States and was then re-elected in 1959.



D. R. Sen.

In thanking the FAO delegates, Sen called FAO an "indispensable forum" for the solution of some of the world's most urgent problems and called upon the Organization's member nations to help him in preserving that forum's strength.

Eight new countries were admitted as members or associate members of FAO at the Conference held the latter part of 1963. Algeria, Burundi, Rwanda, Trinidad and Tobago, and Uganda were elected members and Kenya, Malta, and Zanzibar were admitted as associate members. FAO now has 112 members and associate members. (An associate member differs from a full member only in that it does not have a vote at Conference sessions.)

International (Contd.):

The Conference also voted to elect Georges Haraoui of Lebanon as Independent Chairman of the 27-Nation Council which governs FAO between biennial sessions of its Conference. He replaces Louis Maire of Switzerland who has served in the post since 1959. Haraoui is a member of the Lebanese Parliament and a former Cabinet Minister.

The FAO Conference decided that the number of seats on the FAO Council would be increased to either 30 or 31 from the present 27 member seats. The Conference, however, requested the Council to make recommendations as to whether the increase in seats shall be 3 or 4, to which regions the new seats should be allocated, and wording to change the FAO Constitution in order to provide for the increase. The Council's recommendations will be submitted for adoption to the 13th Session of the Conference, which will be held in 1965.

* * * * *

FISHERIES DEVELOPMENTS IN
BAY OF BENGAL, ARABIAN SEA,
AND PERSIAN GULF PROPOSED:

The Food and Agriculture Organization (FAO) Conference asked the Director-General to help member governments in preparing joint projects to exploit marine resources in the Bay of Bengal, the Arabian Sea, and the Persian Gulf. The Conference's Commission Two asked FAO's help in getting financial and other help from the United Nations (UN) Special Fund and from other agencies in executing the projects.

The Government of Pakistan, jointly with other governments, had proposed two such projects, one for fishing in the seas adjoining the east coasts of Pakistan and Burma, and the other for the Arabian Sea, the Persian Gulf, and other waters adjoining the coasts of Iran, Pakistan, Iraq, Kuwait, Saudi Arabia, and other countries. All those countries supported the proposal.

A resolution adopted by the Commission asked the Director-General to give urgent assistance to those countries in the joint projects, pending the help which might be obtained from the UN Special Fund and other agencies.

The resolution says there was urgent need "for comprehensive projects to be carried out by the governments . . . severally and jointly with the help of FAO and the financial assistance of the UN Special Fund and/or other aid resources. . . ." The projects would include oceanographic and biological surveys and exploration of fishery resources; economic and marketing surveys of fish and fish products; measures to improve fishing boats, gear and nets, and work on the design and location of fish harbors, jetties, cold-storage and processing plants. (FAO, Rome, December 3, 1963.)

SALMON

INTERMINGLING OF UNITED STATES
AND CANADIAN PACIFIC
SALMON UNDER STUDY:

An informal committee to study king and silver salmon along the Pacific coast was formed after a meeting during November 1963 in Vancouver, British Columbia, between Canadian and United States fisheries officials. The study was considered desirable because United States and Canadian stocks of those species are harvested in many areas by commercial and sport fishermen of both countries. There has also been a general decline in king salmon catches during the past few years.

The committee will first review available information on the migratory movements of king and silver salmon. This will be done to determine where and when fish bound for United States and Canadian streams intermingle and the extent of such intermingling in areas where fishing takes place. The review can provide the basis for joint research programs wherever it is indicated additional information is needed.

The Canadian members of the committee are the Director of the Nanaimo (B. C.) Biological Station of the Fisheries Research Board of Canada, and the Pacific Area Director of the Canadian Department of Fisheries. United States members are the Pacific Northwest Regional Director of the U. S. Bureau of Commercial Fisheries, and the Director of the Pacific Marine Fisheries Commission. A technical working group is being appointed by each country to assist the committee. (Canadian Department of Fisheries, Trade News, November-December 1963.)

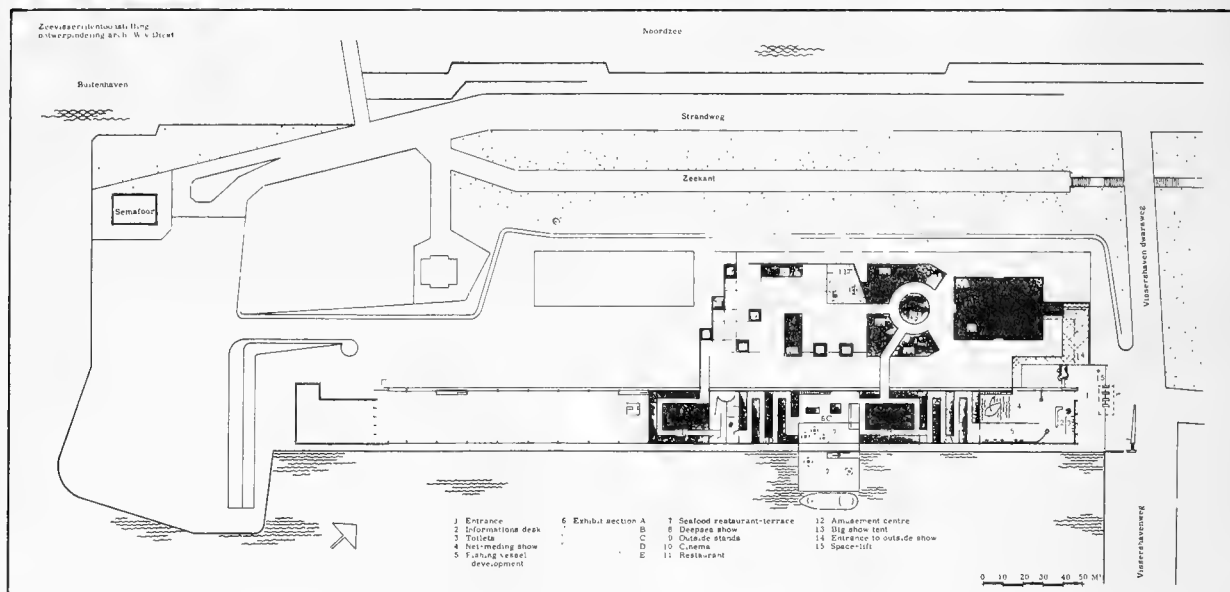
International (Contd.):

INTERNATIONAL FISHERIES EXHIBITION PLANNED FOR SCHEVENINGEN IN THE NETHERLANDS

The international fisheries exhibition described as Scheveningen 64, "Rijk is de Zee" (Rich is the Sea), will be held July 17-29, 1964, at Scheveningen on the North Sea, which is essentially a part of The Hague in the Netherlands. Scheveningen is both a fishing port and seaside resort area and the exhibition is to be held in and around the new fish auction rooms of that port.



The new fish auction hall along the first inner harbor at Scheveningen, Holland.



Floor plan of exhibit.

Organizations and institutions in the Netherlands as well as those in other countries have shown considerable interest in the exhibition and discussions have been held with many fishery nations on participation and contributions.

Plans call for the exhibition to be a gala event including a completely decorated first inner harbor as well as fully decorated fishing vessels and other craft calling at the port. All of the fishing ports in the Netherlands are expected to contribute to the event.

A terrace is planned to be built over part of the harbor adjacent to a special seafood restaurant overlooking the sea. One of the

main attractions at the exhibition will be a deep-sea show. By means of a skillful ultra-violet illumination system, visitors to the show will have the impression that they are walking below sea level.

Note: For additional information write: M. Van de Meeberg, Adviesbureau voor Public Relations, Lange Voorhout 16, 's-Gravenhage, Netherlands.

WHALING

FLEET COMPOSITION OF 1963/64 ANTARCTIC WHALING SEASON:

A total of 16 factoryships were used during the 1963/64 Antarctic whaling season. This is one factoryship less than in the 1962/63 season as the British vessel Southern Harvest, which was sold to Japan during

International (Contd.):

1963, did not participate in the 1963/64 season. With the Japanese purchase of the Southern Harvest in 1963, the United Kingdom became a nonwhaling nation in the latest Antarctic whaling expedition. The Southern Harvest was a sistership of the Southern Venturer which was purchased jointly from the British in June 1962 by Japan's three whaling companies in conjunction with another Japanese fishing firm.

No definite information is available at this time on how many catcher vessels the four Soviet factoryships are using. If the estimate is used of 70 Soviet catcher vessels (the same as calculated for the 1962/63 season), the 16 factoryships operated by the four whaling nations participating in this season's expedition would be using a total of 192 catcher vessels.

Aden

INTERNATIONAL INTEREST IN GULF OF ADEN FISHERIES:

During June through October 1963, international fishing activities in the Gulf of Aden and southern Red Sea waters showed a great increase over previous years. By far the greatest interest was shown by the Soviets, although the British, Americans, and Italians did some survey work.

In mid-1963, a small Soviet fleet of purse-seine vessels supported by a carrier vessel and a refrigerated mothership operated in the central Gulf of Aden along the north coast of Somalia, and also adjacent to Aden. Yellowfin tuna, skipjack tuna, and large jack mackerel were the main catch of the Soviet purse seiners. They claimed to have averaged about 15 good fishing days per month and a catch of 10 metric tons per day per vessel.

Antarctic Whaling Fleets, 1963/64 Season With Comparisons

| Country | 1963/64 | | 1962/63 | | 1961/62 | |
|--------------------------|--------------|-----------------|--------------|-----------------|--------------|-----------------|
| | Factoryships | Catcher Vessels | Factoryships | Catcher Vessels | Factoryships | Catcher Vessels |
| Norway | 4 | 33 | 4 | 32 | 7 | 71 |
| United Kingdom | - | - | 1 | 9 | 2 | 22 |
| Netherlands | 1 | 11 | 1 | 11 | 1 | 15 |
| Japan | 7 | 78 | 7 | 79 | 7 | 85 |
| U. S. S. R. | 4 | 1/70 | 4 | 70 | 4 | 67 |
| Total | 16 | 192 | 17 | 201 | 21 | 260 |
| 1/Estimated. | | | | | | |

The two land stations on South Georgia--Grytviken and Leith Harbour--were leased to the Japanese whaling companies for the 1963/64 season. Grytviken, which was activated from October 1 to November 30, 1963, during the previous season, is using 8 catcher vessels. Leith Harbour, which was to operate during the whole permissible catching season (October 1, 1963 to March 31, 1964), was to use 7 catcher vessels, except during the period from October 31, 1963 to March 1, 1964, when possibly only 5 catcher vessels might be used.

Of the 192 catcher vessels used during the 1963/64 season, 4 were built before 1940, 50 during 1940-49, 95 during 1950-59, and 43 during 1960-62. (Norwegian Whaling Gazette, December 1963.)

Note: See Commercial Fisheries Review, October 1963 p. 63; September 1963 p. 84; August 1963 p. 78.



In the fall of 1963, tuna schools began to swim deep and below the reach of the purse-seine nets. Since the Soviet vessels were not equipped for long-line operations, they returned to their Black Sea ports. With suitable alterations to their purse-seine equipment, they are expected to return to the Aden area in May 1964.

Two Soviet stern trawlers operated along the coast of the eastern Aden Protectorate in the summer of 1963. The vessels, the Alushta and the Shota Rustaveli, claimed excellent results. Catches were said to have reached 30 tons per day per vessel, and 1 of the 2 claimed to have taken 400 tons in 20 days. The fish taken by the trawlers were sold mainly in Colombo, Ceylon. The vessels used Aden as a source of supplies and fuel.

It has been reported that an Egyptian delegation visiting Moscow in late 1963, attempted to negotiate arrangements for Soviet fishing

Aden (Contd.):

vessels in the Indian Ocean and Red Sea to take their catches directly to Port Suez for sale.

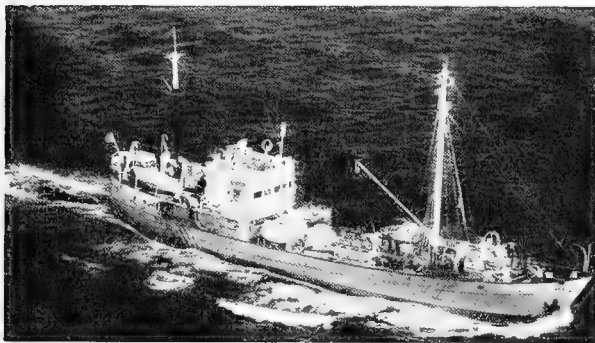


Fig. 1 - Soviet research vessel Konstantin Boldyrev.

Soviet research vessels, including the Konstantin Boldyrev and Vladimir Vorobjov, have been active in the Gulf of Aden and the Red Sea as far as the Sudanese coast. They have indicated that Yemen coastal waters may have a rich fisheries potential.



Fig. 2 - Soviet research vessel Vladimir Vorobjov.

Genepesca VII, a privately-owned Italian fishing and survey vessel, has carried out tuna investigations along the Somali coast. During the summer of 1963, the Italian vessel's highest tuna catch rate with long lines was 50 percent with a consistent catch rate of 15 to 20 percent as far west as Berbera.

Discovery II, a British research vessel, visited Aden following a survey expedition in the north Indian Ocean. In early October 1963, the United States research vessel Anton Bruun was in Aden before continuing her researches in the Gulf of Aden and northern reaches of the Indian Ocean adjacent to Muscat and Oman. Partly as a result of those and other visits which are a part of the International Indian Ocean Expedition, the Fisheries Department of Aden expects to begin tagging yellowfin tuna in 1964. This should reveal information on the movements of the different age groups of tuna in the Gulf of Aden. (United States Consulate, Aden, December 12, 1963.)

Note: See Commercial Fisheries Review, February 1963 p. 66, May 1963 p. 56.



Angola

FISH CANNERY PLANNED FOR ANGOLA BY SOUTH AFRICAN INTERESTS:

A fish cannery is planned in Angola by South African interests. A South African company with South African and South-West African directors and capital has bought control of two fish factories in Angola, according to the The Windhoek Advertiser of December 23, 1963, and the Johannesburg Sunday Times of December 22, 1963.

The new joint South Africa-Angola company has 2 South Africans and 5 South-West Africans as directors. The group states that the two Angolan factories are at present worth R1,500,000 (US\$2,115,000). A development program for the factories was discussed at a directors' meeting in Cape Town. At present the factories have no facilities for canning, but are confined to the production of fish meal and fish oil. One of the factories is now producing 200 tons of fish meal per day, which has sold for R80 (\$122) a short ton, and fish oil from the same plant is said to have been sold at R200 (\$282) a ton.

A spokesman for the group announced:

"In addition to establishing the first fish-canning factory in Angola, we will fly fresh rock lobster, crab, and prawns to Johannesburg via Luanda... . The authorities in Luanda will not restrict us in any way."

There is now a Luanda-Windhoek weekly air service operated by the Portuguese airline DTA, and South African Airways' own Boeing 707's now land in Luanda en route to

Angola (Contd.):

and from Europe "by sea." It is the introduction of the latter service which makes possible the export of fresh shellfish from Angola to the Johannesburg market. (United States Consulate, Cape Town, December 31, 1963.)



Australia

FISHERIES LANDINGS, 1962/63:

Australian fisheries landings in fiscal year 1962/63 (July 1962-June 1963) were up 6.4 percent in quantity and 3.6 percent in value from those in the previous fiscal year. With the exception of crab, there was some gain in landings of all leading fishery items. Shrimp landings showed the greatest gain with an increase of 35.3 percent in quantity and 42.2 percent in value due to heavier production in New South Wales, Queensland, and Western Australia. Landings of spiny lobsters were up 5.9 percent in quantity but down 4.2 percent in value.

New South Wales was Australia's leading producer of shrimp, finfish, and oysters in 1962/63. Western Australia was the leading producer of spiny lobsters, and also made rapid gains in shrimp production during 1962/63. (Australian Fisheries Newsletter, December 1963.)

Note: See Commercial Fisheries Review, March 1963 p. 45.



Canada

FISH CATCH, 1962:

Canada's fish catch in 1962 reached an all-time high of 1,115,100 metric tons with a record ex-vessel value of C\$128,730,000 (US\$119,000,000), according to The Yearbook of Fisheries Statistics of the Food and Agriculture Organization (FAO) of the United Nations. The 1962 catch topped by 9,600 tons the previous Canadian high of 1,105,500 tons caught in 1956. It was 95,500 tons above the 1961 Canadian catch of 1,019,600 tons valued at C\$110,639,000 (US\$102,000,000).

Table 1 - Australia's Landings^{1/} and Ex-Vessel Value of Fishery Products, 1961/62 and 1962/63^{2/}

| Species | 1962/63 | | | 1961/62 | | |
|-------------------------------|------------|----------|-----------|------------|----------|-----------|
| | 1,000 Lbs. | A\$1,000 | US\$1,000 | 1,000 Lbs. | A\$1,000 | US\$1,000 |
| Finfish | 80,587 | 6,122 | 13,713 | 78,526 | 6,075 | 13,608 |
| Spiny lobster | 30,532 | 5,570 | 12,477 | 28,821 | 5,815 | 13,026 |
| Shrimp | 12,616 | 1,906 | 4,269 | 9,322 | 1,340 | 3,002 |
| Crab | 843 | 82 | 184 | 875 | 79 | 177 |
| Oysters | 13,028 | 1,123 | 2,516 | 12,613 | 1,014 | 2,271 |
| Scallops | 6,498 | 245 | 549 | 5,172 | 193 | 432 |
| Other shellfish | 987 | 38 | 85 | 1,030 | 45 | 101 |
| Total ^{3/} | 145,091 | 15,086 | 33,793 | 136,359 | 14,561 | 32,617 |

^{1/}Landed weight.

^{2/}Preliminary.

^{3/}Includes landings in Australia's Northern Territory, but excludes fresh-water fish landings in Queensland.

Note: Australian pounds converted to US\$ at rate of 1.00 equal US\$2.240.

Table 2 - Australia's Fishery Landings by States, 1961/62 and 1962/63^{1/}

| Species | New South Wales | | Victoria | | Queensland | | South Australia | | Western Australia | | Tasmania | |
|---------------------------|-----------------|---------|----------|---------|------------|---------|-----------------|---------|-------------------|---------|----------|---------|
| | 1962/63 | 1961/62 | 1962/63 | 1961/62 | 1962/63 | 1961/62 | 1962/63 | 1961/62 | 1962/63 | 1961/62 | 1962/63 | 1961/62 |
| | (1,000 Pounds) | | | | | | | | | | | |
| Finfish | 31,598 | 27,071 | 12,011 | 12,259 | 29,041 | 28,834 | 16,137 | 15,059 | 8,017 | 8,895 | 3,467 | 6,182 |
| Spiny lobster | 498 | 398 | 1,080 | 1,138 | 31 | 58 | 4,650 | 4,025 | 20,512 | 19,238 | 3,761 | 3,964 |
| Shrimp | 6,623 | 4,678 | 4 | 4 | 4,971 | 4,400 | - | - | 1,017 | 239 | - | - |
| Crab | 228 | 190 | - | - | 571 | 625 | - | - | 36 | 59 | - | - |
| Oysters | 12,604 | 12,204 | 63 | 65 | 330 | 323 | - | - | 28 | 10 | 1 | 1 |
| Scallops | - | - | - | - | 627 | 400 | - | - | 3/ | - | 5,871 | 4,772 |
| Other shellfish | - | - | 860 | 899 | 119 | 117 | - | - | 8 | 14 | - | - |
| Total | 51,551 | 44,541 | 14,018 | 14,365 | 15,690 | 14,757 | 20,787 | 19,084 | 29,618 | 28,455 | 13,100 | 14,919 |

^{1/}Preliminary.

^{2/}Exclusive of fresh-water fish landings in Queensland.

^{3/}Less than 500 pounds.

Note: Total Australian fisheries landings shown in table 1 are greater than the combined total landings in the individual states which do not include landings in the Northern Territory.

Canada (Contd.):

Canada's catch represented 2.5 percent of the 1962 world catch of 44.72 million tons, and ranked Canada number seven among the major fishing nations, behind Japan, Peru, Mainland China, the Soviet Union, the United States, and Norway.

About 850,000 tons of the 1962 Canadian catch was used for human food in fresh, frozen, cured, or canned form. The remainder was processed into fish meal and oil to be used for animal feed and miscellaneous purposes.

* * * * *

FEDERAL-PROVINCIAL CONFERENCE ON FISHERIES DEVELOPMENT:

The first Canadian Federal-Provincial Ministerial Conference on Fisheries was held in Ottawa, January 20-24, 1964. The Ministers concluded that the fishery resource in Canada's inland waters and coastal seas can support a long-term expansion of the fishing industry. The future for Canadian fishermen is bright if a progressive program of education, modernization, and economic encouragement is adopted. The representatives of the Canadian Federal Government and the 10 Provinces agreed to cooperate in working out a national fisheries development program patterned after that in effect for Canadian agriculture.

Such a fishery program would include measures to: (1) expand the available resource, (2) improve catching and processing methods, (3) diversify products and improve quality, and (4) expand markets and reduce price uncertainty. The program would be designed to bring about greater productivity and efficiency in all phases of the fishing industry. It would also have to consider the increasingly important sport fishery.

Many aspects of the fisheries were considered at the Conference. Some of the conclusions reached follow:

The Conference clarified the responsibilities of Federal and Provincial governments in various phases of administration and development. Although the Federal Government has sole responsibility for the enactment of fishery regulations in coastal and inland waters, enforcement in many instances has, by agreement, been undertaken by Provincial authorities. The Federal Minister agreed to facilitate administration of regulations as much as possible through appropriate delegation of authority, and to discuss those problems with interested Provinces.

The Provincial representatives unanimously supported the plan of the Government of Canada to establish a 12-mile exclusive fishing zone measured with straight baselines from headland to headland. The new fishing limits would include such waters as the Bay of Fundy, the Gulf of St. Lawrence, Dixon Entrance, Queen Charlotte Sound, and Hecate Strait as Canadian waters.

The Conference stressed the importance of expanded efforts to discover unexploited stocks in ocean and inland waters. Increased explorations are to be undertaken by the Federal Government.

The need for continuing strict control to prevent poaching in the lobster fishery was emphasized.

Considerable interest was shown by several Provinces in the development of commercial fish farming.

The problem of pollution was recognized as being one of the most serious facing the fisheries today. The need was emphasized for corrective measures. The importance of fisheries representation on pollution boards was generally agreed upon.

The meeting recognized the tremendous and increasing importance of sport fishing. Although promotion of sport fishing is generally a Provincial matter, the Federal Department of Fisheries has responsibility for managing anadromous species (such as salmon) and, in some Provinces, other species as well.

The Conference stressed the importance of basic research to guide conservation and expansion of fishery resources as well as to improve processing techniques. Also emphasized was the need for more applied research and for more effective communication of the results to fishermen and the industry. It was agreed that the Federal Government, through the Fisheries Research Board, has responsibility for research wherever it may be required, especially in its more fundamental aspects. The Federal Minister agreed that the research effort would be increased insofar as funds and qualified personnel permit.

It was recognized that Canada is in a good competitive position through her proximity to very productive fishing grounds. This opportunity could be used to better advantage by adopting the most modern techniques whether developed in Canada or elsewhere. Assurances were given to the Provinces that the Federal Government intends to expand its technical development services, adapting, testing, and demonstrating new techniques in cooperation with the Provinces.

Attention was drawn to the excellent coordination of effort brought about through the Federal-Provincial Atlantic Fisheries Committee on which five East Coast Provinces and the Federal Department of Fisheries are represented. The Provinces in Canada's central area asked that a similar committee be set up for the Prairie Provinces.

The Conference paid particular attention to the need for better education of fishermen as well as others associated with the industry. It noted the steps being taken by several Provinces to meet this need and the very useful contribution of the Federal Department of Labor through its vocational training assistance program. Much, however, remains to be done and the Conference unanimously recommended greatly increased efforts by all concerned. It was hoped that a greater share of the expanding program of the Federal Department of Labor might be devoted to fisheries. The Federal Department of Fisheries also announced its intention to increase its efforts to give specialized advice and assistance.

The Conference stressed the importance of effective long-term planning to provide adequate harbors, marine works, and navigational aids to meet the changing needs of the inshore and offshore fisheries. It recommended the establishment in each Province of a continuing committee representing the appropriate Federal and Provincial agencies to carry out the engineering and economic studies needed for guidance.

The important question of market development was thoroughly discussed by the Conference. On the problem of export market expansion, the Federal Minister of Trade and Commerce outlined the activities of his department and offered its full cooperation in expanding old and opening up new markets for fishery products. The Conference discussed in detail the possible usefulness of marketing board techniques (similar to those of the Canadian Wheat Board) for the handling of the salted cod production of the Atlantic Provinces and the fresh-water products of the inland lakes. It was agreed that the subject required further specialized study. Arrangements were made for an early meeting representatives of the Provinces of Ontario, Manitoba, Saskatchewan, Alberta, and the Federal Government to consider establishing a fresh-water fish marketing board. Arrangements were also made to hold a meeting of representatives of the Atlantic Provinces to discuss a proposal put forward by Newfoundland for the establishment of a salted cod marketing board.

The Conference considered present arrangements for the provision of financial assistance to fishermen and the fishing industry. The general view appeared to be that present arrange-

Canada (Contd.):

ments suffered from a lack of coordination and in some particular instances failed to meet requirements. The consensus was that the objectives of a fisheries development program called for the investment of public and private funds in a coordinated and comprehensive program, designed to operate on a national scale but adapted to regional needs. Such a program would include improved credit facilities and some adjustment of present vessel construction assistance measures. It was generally felt that Provincial loan agencies could best meet the capital credit requirements of fishermen, but the view was expressed that the Federal Government might assist through making available additional capital for such purposes.

The Federal Minister said that the need for assistance coming under the main headings of credit, subsidies, and grants varied in different Provinces and areas. He suggested that the matter should be further discussed between the Federal and Provincial Governments on a regional basis. (Report by Canadian Minister of Fisheries, Ottawa, January 24, 1964.)

* * * * *

FISHERIES MINISTER EMPHASIZES NEED FOR SCIENTIFIC RESEARCH:

The need for a scientific basis to maintain and develop Canada's fisheries was emphasized by the Canadian Fisheries Minister in a message on January 4, 1964, to the opening of the annual meeting of the Fisheries Research Board of Canada. The protection of the fisheries resource through domestic or international regulation of fishing depends on research into many important stocks, said the Minister, and the hope for improvement of the resource through cultural methods depends on biological research of a complicated and basic nature. Canada's competitive position, internationally, depends on the quality and volume of her research effort on the high seas. The Minister also mentioned the dependence of industry on research for the technical development of processing techniques.

The Fisheries Research Board of Canada is made up of 18 members who serve without salary and are drawn from the scientific staffs of Canadian universities, the fishing industry, and the Government. The Board directs the scientists, oceanographers, and technologists working from seven research stations throughout Canada. (Canadian Department of Fisheries, Ottawa, January 6, 1964.)

The following reports and subjects on research conducted by Canadian fishery laboratories and stations were discussed at the annual meeting of the Fisheries Research Board of Canada, held in Ottawa in early January 1964:

COD POPULATION IN NORTHWEST ATLANTIC STUDIED:

Cod spawn progressively later in the south than in the north in the Newfoundland area, and the largest fish are generally the last to spawn. This was brought out in maturity studies carried out by scientists attached to the St. John's (Nfld.) Biological Station of the Fisheries Research Board of Canada. In their 1963 studies, the scientists found that, in April, spawning was nearly completed in the Labrador and Northeast Newfoundland Shelf area, although it had not yet begun on the northeastern Grand Bank. On the northern Grand Bank, spawning was almost completed by the latter half of May.

For age and growth studies of the cod, the fisheries scientists collected about 20,000 pairs of otoliths (ear bones). The otoliths were taken from fish caught in inshore and offshore waters and will be examined at the St. John's laboratory.

The 1963 cod study also covered routine sampling of the inshore fishery. This will provide biological background information to be used in population studies of cod in the area. The sampling was carried out in the spring, summer, and fall at regular sampling stations in several of the larger fishing ports. Commercial fishermen working the inshore waters reported varying regional success with traps, and generally poor results with other gear throughout the season. The nylon gill net became an important gear in use in many localities.

The studies revealed that, in the inshore fishery, cod are first retained in numbers by cod traps at four years of age. During 1963, the bulk of the trap catches consisted of cod in the 5- and 6-year age group. For the various line gears, cod aged from 6 to 8 predominated. But in the fishery using nylon gill nets, most of the cod caught were of large size, age 8 and older.

NORTH ATLANTIC LOBSTER INDUSTRY:

Studies of the North Atlantic lobster (*Homarus americanus*) from the larval stage to marketing, and the economic effects of maritime lobster regulations were discussed at the annual meeting of the Fisheries Research Board of Canada, held in Ottawa early in January 1964. Over the years a very large store of knowledge has been built up around that marine crustacean which is the source of millions of dollars in revenue to Canadian and United States fishermen. The catch of about 50 million pounds a year and its generally high price make the lobster the most valuable single species taken by Canadian fishermen.

Canada (Contd.):

At the January meeting, present and future research on marine crustaceans was discussed. Scientists of different disciplines, while stating that much has been learned about the lobster, reported that there are still many unknown factors which must be studied, and they are collaborating in the effort to throw more light on the subject. Biologists and technicians at the St. Andrews, N. B., Biological Station of the Board are concentrating on the biological aspects, and scientists at the Board's Technological Research Laboratory in Halifax, N. S., are centering their attention on the chemistry of the Atlantic lobster. At the same time economists of Canada's Department of Fisheries are examining the structure, organization, and operations of the lobster fishing enterprise in the Atlantic provinces.

Management of the lobster fishery was essential to continued productivity, stated one of the biologists associated with studies conducted at the St. Andrew's station. He described the application of size limits and fishing seasons, which vary in different areas of the Canadian Atlantic coast, on the stocks of lobsters. In the area east of Halifax the fishing season usually lasts two months, generally in the spring; west of Halifax the seasons are longer but extend through the winter and early spring. Peak lobster landings are made in May and June. The biologist said that short fishing seasons did not necessarily reduce the catch, as the fishermen tended to increase their fishing during the shorter open seasons. While the productivity of lobsters is conditioned more by natural factors than by regulations, the latter are necessary not only from a conservation standpoint but for their economic effects.

The meeting was told that interaction of the biological and the economic factors is particularly intense in the lobster fishery. An official of the Economics Service of the Federal Department of Fisheries described the economic effects of regulations as divided into three main categories: (1) administration, such as licensing of fishermen, the establishment of fishing districts and limitation of the number of traps; (2) conservation, including limitation of the type of gear, minimum size limits, length of seasons, and prohibition of the taking of egg-bearing lobsters; and (3) marketing, which was related to the allocation of fishing seasons by districts and minimum size limits.

The physiological aspects of lobster research, both in relation to the shipment of live lobsters and the lobster in its natural environment were reported on by two scientists of the Board's St. Andrews station. Scientists who are also SCUBA divers have begun an underwater study in certain sections of Northumberland Strait to determine where lobster larvae settle after they leave the free-swimming stage which they enter when the eggs are released from the female, and sink to the bottom of the ocean. These larval studies were begun 20 years ago, and one of the aims is to find out if future stocks can be predicted on the basis of larval abundance. The underwater work is tied in directly with laboratory observations on the commercial possibilities of lobster stocks, made with a view to aiding the lobster industry.

Fisheries technologists engaged in studies at the Halifax laboratory are directing their attention to the chemistry of the lobster. With the rapidly increasing demand for live lobsters, scientists are seeking more information on the effects of live-holding on the physiological condition of the lobsters and their ability to withstand infection and the stresses of live-holding and shipment of the lobsters themselves. Reporting on this aspect, it was stated that many factors are involved, and if not properly controlled can lead to the death of lobsters with ensuing financial losses to the industry. Biochemists have proved that the constitu-

ents of the lobster's blood, particularly the blood cell counts, are altered during live-holding and can serve as indexes of the general health of lobsters. Experiments have shown that weakened lobsters can be strengthened and their resistance to infection increased by proper feeding in fresh sea water.

Research by biologists has proved that lobsters generally remain in a local area and that they move about very little. A member of the Board pointed out that lobsters are internationally known when it comes to marketing. The Board member, who operates one of the biggest if not the biggest lobster holding pound in the world, said that within hours after the lobsters are caught on the Atlantic coast, they are ready to be eaten in such widely separated cities as Ottawa and Paris, and in countries including Holland, Belgium, and throughout the United States. He added that there were probably more lobsters flying the Atlantic Ocean today than people.

While acknowledging the enormous amount of research already done on lobsters, it was pointed out at the Board meeting that further studies were required in catching, handling, processing, and shipping. There was great concern over the loss of lobsters through natural mortality after they are caught and it was felt that more knowledge of the species, which would indicate improved handling and holding conditions, might counteract this loss. In such research, it was felt that the Fisheries Research Board, the Federal Department of Fisheries, and the fishing industry each had a part to play.

Research being conducted by the Board's Biological Station at Nanaimo in British Columbia on crab and shrimp on Canada's Pacific coast was related by another biologist. One of the problems facing the crab fishery is "ghost fishing" . . . the continued kill by traps which are lost but, because of their sturdy construction, continue in fishing order, thus killing many crabs which cannot be recovered. The Canadian scientists were working on a variety of corrodible metal wires which would deteriorate and cause lost traps to collapse. Investigations on shrimp are designed to provide further information on stocks in the major shrimp trawling areas as well as to delineate the extent of shrimp fishing grounds.

Studies relating to lobsters and shrimp in Newfoundland waters was another subject discussed by a scientist from the Board's Biological Station in St. John's, Newfoundland. Stocks of shrimp had in the past been found as the result of exploratory fishing but a commercial fishery had yet to be developed. A practically interesting line of research on lobsters concerned the social behavior of the creatures. There were indications that lobsters establish personal territories and resist the efforts of other lobsters to reside within their sphere of habitation. This would take the form of cannibalism by older lobsters on the young, and fighting off intruders. Studies on growth rates, the scientist said, had shown that lobsters increase in weight by almost 50 percent after their first molt and by about 40 percent after the second molt. This indicated strong support for the re-turning of small, undersize lobsters to the water in order to let them grow to larger and more profitable market sizes. (Canadian Department of Fisheries, Ottawa, January 7, 1964.)

PACIFIC SALMON TRANSPLANTED TO ATLANTIC COAST:

The experimental transplanting of British Columbia pink salmon eggs to a stream 5,000 miles distant in Newfoundland may enrich

Canada (Contd.):

East Coast salmon resources. The project is being carefully watched by the St. John's Biological Station of the Fisheries Research Board of Canada.

In the fall of 1962, 2.5 million eggs flown in from British Columbia were planted in a channel of the North Harbor River on the Avalon Peninsula of Newfoundland. Survival was excellent. The fry run amounted to 84 percent of the transplant as a result of favorable weather during the planting, scarcity of silt in the river, and moderate winter conditions.

Hatching began around February 15 and was completed by March 22, 1963. The fry run extended from May 7 to June 16, reaching a peak on May 24. In two days (May 23 and 24), over a million fry, or half the total run, passed through the counting fence. In their seaward migration, it was noted that the fry remained near the surface and close to shore. In two months, they had moved 22 miles from the mouth of the river.

Predation did not appear to be a serious problem. Sampling of trout moving downstream in the river indicated 12 percent had been feeding on the salmon fry. Further investigation disclosed no predation from hering. Sampling of commercial catches of cod in St. Mary's Bay revealed no fry in the stomachs of nearly 4,000 fish examined.

The exceptionally good survival and the comparatively minor loss through predation are promising signs in the attempt to introduce a new species of salmon to Newfoundland.

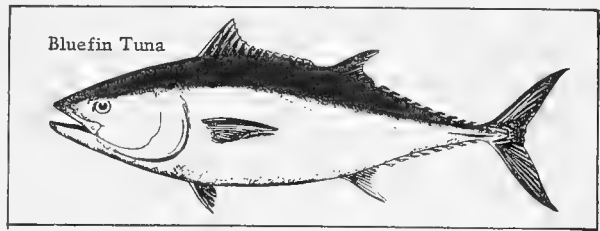
SALMON ESCAPEMENT ON EAST COAST IMPROVED IN 1963:

The escapement of Atlantic salmon to spawning grounds in Newfoundland rivers in 1963 was encouraging, according to the St. John's (Nfld.) Biological Station of the Fisheries Research Board of Canada. The Little Codroy River had its largest run since 1957. The increase, due mainly to a large number of grilse, was about twice the escapement recorded during the years 1960-1961. Throughout the migration period, water levels in the rivers were generally favorable, and the spawn-bearing fish had little difficulty getting upstream.

On the other hand, the run of smolts (young salmon on their first seaward migration) was the smallest on record for the Little Codroy River. This was probably due to the small numbers of adults that entered the river in 1959 and 1960.

TUNA MIGRATIONS OFF ATLANTIC COAST STUDIED:

The tagging of 18 bluefin tuna off St. Margaret's Bay, Nova Scotia, in the summer of 1963, initiated a Canadian study of Atlantic tuna migrations. The work is being done by scientists of the St. Andrews (N. B.) Biological Station of the Fisheries Research Board of Canada. The marking experiment involved large bluefin weighing between 400 and 600 pounds. After capture in a trap net, the giant fish were tagged with dart-type tags and released. None of the tags had been recovered by early January 1964.



That bluefin tuna cross the Atlantic Ocean has been proved by United States tagging studies. But much more information about tuna movements is needed. For example, a few years ago, tuna suddenly disappeared from the waters off Wedgeport, N. S., which had been a famous hunting ground for sport fishermen. Now, with increasing attention being given to the newly developed purse-seine fishery for tuna in the Atlantic, St. Andrews scientists hope to gain new knowledge about this elusive fish.

Late in the summer and early fall of 1963, two fishing craft out of Campobello initiated the first tuna-seining project by Canadian fishermen on the Atlantic. The fishing was carried on along the American seaboard as far south as Block Island. One of the boats enjoyed a fair degree of success considering the lateness of the season and newness of the operation.

HARP SEAL STOCKS DECLINE:

To learn more about the declining stocks of harp seals in the Gulf of St. Lawrence, extensive tagging of "whitecoats" (young harp seals) has been undertaken by the Canadian Fisheries Research Board's Arctic Unit.

Canada (Contd.):

The Board is offering a nominal reward for recaptured harp seal tags which are returned to the Arctic Unit in Montreal. Scientists expect the tags to provide additional clues concerning the population of the seal herd in the Gulf of St. Lawrence, the animals' migration patterns, and the proportion of the whitecoats caught by sealing activities each spring.

Extensive data already collected by the Arctic Unit reveal that the stocks of harp seals in the Gulf of St. Lawrence as well as on the "Northern Front" (off the east coast of Newfoundland and Labrador) have been going down in recent years, the indications being that the catch has been too high. The increase in the value of seal pelts has heightened the pressure of seal hunters.

As the result of aerial surveys and other studies, scientists have estimated the combined population of seals on both the "Front" and in the Gulf to be somewhat less than 1.5 million seals. It is thought that about one-third of the pups whelped each year can be safely harvested. But the annual catch is believed to be considerably in excess of that proportion.

Because of the low level of sealing activities during World War II, the seal herds showed a considerable buildup. Since that time, sealing operations have been intensified to the point where they are now thought to be comparable to those at the turn of the century. However, today's fleets are more efficient. The use of helicopters and light aircraft have given the sealers greater versatility and striking power. It is estimated that aerial sealing accounted for one-half the seals taken in the Gulf of St. Lawrence in the spring of 1963.

In 1963, ships of three nations--Canada, Norway, and the Soviet Union--engaged in the harp seal fishery in the Northwest Atlantic, observing by mutual consent an opening date of March 10 on the "Front." For Canadian operations in the Gulf of St. Lawrence, the opening date was March 5. In addition, landsmen (sealers operating from the shore) took seals when favorable winds brought the icefloes within walking distance. They also took seals in nets during migrations in other seasons.

The recognition last spring of an earlier closing date (April 30) for killing seals is believed to have helped reduce the catch of the older, breeding seals. In order to pursue additional seal conservation measures, the problem has been brought before the International Northwest Atlantic Fisheries Commission, which is concerned with the investigation and conservation of the major fisheries in the Northwest Atlantic. It is hoped that harp and hood seals can be brought within the responsibility of the Commission by a protocol amendment to the Convention under which this Commission operates. Ratification of such an amendment by member countries is expected. (Canadian Department of Fisheries, Ottawa, January 8, 1964.)

NORTH PACIFIC GROUND FISH RESOURCES STUDIED BY SCIENTISTS:

The groundfish resources of the North Pacific Ocean are being studied by fishery scientists of the Nanaimo (B.C.) Biological Station of the Fisheries Research Board of Canada. The Pacific ocean perch is a species of con-

siderable economic value off British Columbia. Farther to the north, it is sought mainly by foreign fleets. But changing market conditions or other situations may eventually influence the development of a Canadian offshore ocean perch fishery and, if this happens, the Research Board will have the answers to the questions which industry may raise.

Using the new research vessel G. B. Reed, scientists of the Nanaimo Biological Station carried out two major North Pacific investigations in 1963. On the initial cruise, extensive explorations for ocean perch were conducted in the eastern Gulf of Alaska in the area off Cape Spencer. The second cruise extended farther west covering grounds in the vicinity of Kodiak Island. The second cruise had a double purpose. Studies were made on the local shrimp populations as well as on the distribution of ocean perch.

The first cruise covered waters where no fishery existed. Large catches of ocean perch were common--as much as 16,000 pounds were taken per 30-minute drag.

The Nanaimo Biological Station plans to expand its program in order to obtain additional information on the biology of the ocean perch.

SALMON STUDIES IN GULF OF ALASKA:

Significant numbers of pink salmon of Asian origin travel as far eastward as the mid-Gulf of Alaska. This was learned during tagging studies by Canadian fisheries scientists. Personnel of the Nanaimo (B.C.) Biological Station of the Fisheries Research Board of Canada have also found that some of the chum salmon tagged in the Gulf of Alaska are of Asian stocks. Tagging programs have been the key to a major break-through in obtaining knowledge of salmon during their ocean existence.

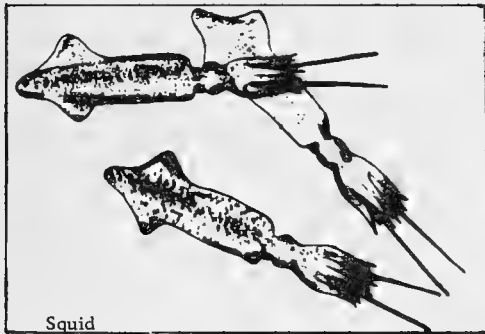
Early in 1964, Canada's new research vessel G. B. Reed and a United States research vessel will begin cooperative North Pacific investigations in an effort to find where salmon spend the winter months.

The two vessels will range over an area extending from the Oregon coast to the Aleutian Islands.

Canada (Contd.):

**FISHERY RESOURCES OF
FAR NORTH SURVEYED:**

A wide assortment of unusual species is found in the water wastes of Canada's far north. There are octopus, squid, crab, long-toothed narwhal (whales), and curvetoothed walrus. Also found, are tiny fossil skeletons of organisms normally found at great depths under tropical Atlantic waters, according to a report at the annual meeting of the Fisheries Research Board of Canada.



Both the octopus and squid are normally warm water species, but some crab and a relatively small species of squid have previously been found in the colder northern areas. But octopus had not previously been found in the North American Arctic region until dredged up from the bottom of Darnley and Franklin Bays by scientists of the Board's Arctic Unit in 1963. Scientists were also surprised to find tiny calcareous fossil skeletons called "discoasters," which micropaleontologists had considered to be extinct products of unknown organisms. The fossils were found in primitive, tiny, whiplike creatures called dinoflagellates whose discoasters are identical to those forming deep sediments found in a core drilled to a depth of 12,450 feet below tropical Atlantic waters.

The narwhal is a whalelike species with a corkscrew tusk sometimes reaching nine feet in length. The narwhal's blubber and edible meat are good sources of oil and food, while the tough carcass provides large strips of valuable sinew used in sewing boots and clothing. The long ivory tusk is of some practical value to the natives who sell it intact for C\$1 a pound. A large tusk will weigh as much as 40 pounds.

The Canadian scientists investigated the range of virtually untapped populations of

Greenland cod which inhabit Dolphin and Union Straits and Coronation Gulf, between the District of MacKenzie and Victoria Island. Such a resource has prime importance as a domestic food supply which would also help relieve the pressure on other species, such as char and lake trout, and on the limited mammal stocks.

The project of depth-probing and surveying fish populations in Canada's Great Bear Lake also was discussed by scientists of the Board's Arctic Unit at the annual meeting of the Fisheries Board of Canada.

Great Bear Lake is located within the Arctic Circle in Canada's Northwest Territories and has an area of 11,800 square miles making it the fourth largest lake on the North American continent. Only Great Slave Lake, also in the Northwest Territories, is as deep as Great Bear. During the summer of 1963, a 5-pound lake trout was caught in a fishery scientist's test net and hauled straight up from a "float-popping" depth of 1,350 feet. The scientists were sure the net had fished at the bottom of the lake because of the large amount of mud still clinging to it when brought to the surface. Plastic floats on the net were broken by the pressure and it seemed apparent that the type used "popped" apart at around the 600-foot depth.

The abundance and even the condition of the fish stocks in Great Bear Lake vary widely in different parts of the lake. But whether caught below or above "float-popping" levels, the lake trout there run to unusually large sizes. One angler, using light spinning tackle, caught four lake trout in one afternoon with the largest weighing in at 30 pounds. The largest lake trout netted by the scientists scaled 40 pounds and there are reports of 60-pounders having been taken. The prospects for a commercial fishery on Great Bear Lake are not very promising at this time mainly because of its remoteness, but the native population depends on that large body of water for a major part of its food supply. The lake also provides an excellent sport fishery and there are several sportsmen's lodges in the vicinity.

Another northern species within the Arctic Circle, on which intensive studies continued during the past year, is the Arctic char. This species has been sold commercially and has met with some success in a number of large cities in Canada and the United States. Com-

Canada (Contd.):

mercial fisheries for char have been established at Wellington Bay on the south coast of Victoria Island, Frobisher Bay on Baffin Island, Payne Bay on the west side of Ungava Bay, and Port Burwell on the east side of Ungava.

The Arctic char is a slow-growing fish and in some of the more northern areas the fish are as much as 28 years old when they reach an average maximum size of seven pounds. The size of the fish varies and specimens up to 23 pounds have been caught.

Commercial fishing operations for Arctic char were initiated after scientific studies were made to determine the quantity that may safely be harvested each year. Subsequent studies have shown the presence of Arctic char in many other areas but the most promising new find up to now is the Nettiing Lake system on Baffin Island. On the basis of a yield of one pound of fish per acre, it is estimated that this lake (which is the sixth largest in Canada) could produce a yearly quota of 500,000 pounds of char without fear of depleting the resource. But considerable additional studies will be required to substantiate that theory, and before any commercial operations could be started, facilities for handling the catch as well as for shipping to southern markets would be necessary.

Note: See Commercial Fisheries Review, March 1963 p. 51.

DEVELOPMENTS IN REFRIGERATION ABOARD VESSELS:

There is a growing use in Canada of ship-board refrigeration systems developed by the Vancouver (B.C.) Technological Laboratory of the Fisheries Research Board of Canada. The total single-trip holding capacity of the refrigerated sea water systems on Canadian vessels amounted to nearly four million pounds at the end of 1963. That type of refrigeration is widely used on British Columbia salmon transport vessels.

Two large tuna purse-seine vessels being built in eastern Canada will have brine-spray freezing systems which were also developed by the Vancouver Technological Laboratory in collaboration with the Industrial Development Service of the Canadian Department of Fisheries.

The largest fishing vessel built in British Columbia in recent years, the Royal Pacific, was equipped with a brine-spray freezing system as well as a dry cold-storage. A sistership under construction will have similar refrigeration equipment. Those vessels will probably employ the equipment to freeze halibut at sea.

"AIRLIFT" PUMP TO UNLOAD FISHING VESSELS BEING DEVELOPED:

Fish larger than herring are usually discharged by hand-forking to hoisting devices. This process delays the movement of fish to the production line and, in itself, can be detrimental to the quality of fish. To overcome this problem, pumps are being developed by fisheries engineers of the Vancouver, (B.C.) Technological Laboratory of the Fisheries Research Board of Canada.

Two pumps employing similar cycles of alternate suction and pressure were built and operated successfully on a commercial scale. The pumps can deliver about 1,000 pounds of salmon per minute.

The third and latest pump employs the "airlift" principle. The "airlift" pump, which is now being tested commercially, has no moving parts and requires only a supply of low-pressure compressed air for its operation. It is a simple system which can be installed on vessels or at dockside at comparatively low cost.

IMPROVEMENT IN TEXTURE OF FISH FILLETS STUDIED:

The texture of cod fillets can be improved, according to scientists of Canada's Fisheries Research Board who have been investigating the texture of fillets cut from that species. They have found that, depending on the condition of the fish at the time it is caught, holding the fish alive for limited periods in 40° F. sea water before slaughtering can result in better textured fish fillets for freezing.

The cod studied were small and medium fish which spend part of their lives each spring and summer feeding in the relatively warm waters (45° to 55° F.) along the North-east Atlantic Coast. Sea water at a temperature of 50° F. is relatively warm for cod as

Canada (Contd.):

compared with bottom waters on the fishing banks having a temperature as low as 33° to 35° F. Shore catches must often be held alive in sea water almost that cold before the meat undergoes changes sufficiently great to be noted by those tasting the cooked sample.

The texture studies are being conducted by the Board's St. John's Unit which reported at the annual meeting in Ottawa on January 7 on the apparent high quality of some of the cod landings. Those fish do not need to be held alive. Other lots of fish caught live and subsequently held in 40° F. sea water have been slaughtered, processed and frozen, and found by taste panelists to be much superior in texture to fish processed within a few hours after being taken from the sea. In some instances holding times as short as ten days have been beneficial.

More work is being done to establish the full range of benefits from a period of live storage in relatively cold sea water. Scientists are also tackling the problem from still another angle--changing the methods of handling and chilling fish killed at cod traps. If those fish could be treated so that they would keep well in frozen storage it would not be necessary to hold them live for a period of time. But so far, best results have been obtained by dealing with the live fish.

NEW METHOD TO SPEED TUNA CANNING DEvised:

The time consumed in processing tuna from the raw to the canned state has been significantly reduced as a result of a new method devised by scientists of the Fisheries Research Board of Canada. Personnel of Canada's Technological Research Laboratory at Vancouver, B. C., worked closely with a British Columbia fish-processing plant in modifying a retort, the huge "pressure-cooker" used in the canning process. The modifications included reinforcement of the retort to withstand a vacuum, and the installation of special devices for steam condensation and ejection of condensing water.

Tuna, unlike salmon and most other fish, must be precooked prior to the actual canning. Whole tuna are placed in the retort and cooked for a predetermined period of

time. Until this new method was introduced, the precooking was followed by a cooling period of several hours in which no further processing could take place. As a result of the modifications by Canadian scientists, this delay no longer is necessary as very rapid cooling is accomplished under vacuum and the tuna can be processed immediately.

SCIENTISTS DEVELOP NEW PROCESS FOR SMOKING SMALL FISH:

In order to reduce handling costs when smoking small fish such as smelt and alewives and to improve product appearance, Canadian scientists have incorporated new features into a vertical-type smoke tunnel. Fish are fed into the smokehouse at one end and they emerge automatically at the other end, fully smoked. The speed of the conveyor system inside the smokehouse can be regulated to insure sufficient smoke pickup.

Ordinarily, small fish shrivel during smoking and they also show screen marks on their sides. But specially-built holders in the improved smokehouse tumble the fish gently so that they assume a firm, roundish shape, free of wrinkles and of screen marks.

Additional work to further improve the new smokehouse is being done by the Fishery Research Board of Canada at its Technological Station in London, Ontario.

NEW ELECTRONIC FISHERY RESEARCH AIDS DEVELOPED:

New electronic devices to improve fisheries research techniques are being introduced at the Nanaimo (B.C.) Biological Station of the Fisheries Research Board of Canada. A photo-electric apparatus designed to count migrating sockeye salmon shows promise of doing the job more accurately, much faster, and with less effort than methods currently in use. The photo-electric fish counter underwent large-scale tests in 1963 at Babine Lake in northern British Columbia.

A new instrument which makes it possible to observe young salmon while they are still submerged in gravel beds is also in development. The "snooperscope" uses infrared light to illuminate the young salmon and make them visible to the eye. The use of infrared light protects the salmon from the effects of ordinary light at this sensitive stage.

Canada (Contd.):

A third instrument already being used successfully is an electronic baleen plate reader. This device accurately sketches a diagram of the tiny ridges on sections of baleen taken from whales. The number of ridges is a fairly accurate indication of the age of a whale. Earlier, the ridges were read by touch, a difficult task even for experienced personnel.

WAYS OF PRODUCING FISH PROTEIN CONCENTRATE STUDIED:

The production of fish protein concentrate (FPC) from noncommercial species (dogfish, skate, sculpin, etc.) is being studied by scientists at the Halifax Technological Station of the Fisheries Research Board of Canada. After producing FPC (also known as fish flour) from haddock and cod fillets, the Halifax investigators began experiments with whole fish (including herring), fish offal, and semiprocessed fish meal known as "press cake." The FPC produced from fillets received the highest protein rating, its flour being whiter than that produced from other raw materials. However, in all cases the protein rating was excellent.

FISH MEAL EXPERIMENTALLY STORED IN 2,000-POUND CONTAINERS:

A new method of storing herring meal in one-ton packages is being investigated by the Vancouver (B.C.) Technological Laboratory of the Fisheries Research Board of Canada. The 2,000-pound containers are made of laminated paper. At present, herring meal is usually stored in 100-pound bags, which reduces the amount of herring meal that may be stored in a given area. One of the major problems in storing herring meal in bulk is the self-heating tendency of the meal. To suppress this tendency, antioxidants have been added to the meal in the large containers. The preliminary results of the project are encouraging. (Canadian Department of Fisheries, Ottawa, January 6, 7, and 8, 1964.)



Denmark

LANDINGS AND FISHING INDUSTRY TRENDS, 1962-1963:

Preliminary data on Denmark's 1963 total fishery landings show they were up 3.3 percent in quantity and increased 1.0 percent in value from the previous year. The 1963 land-

Table 1 - Danish Fishery Landings by Principal Species, 1961-1963

| Product | 1/1963 | | | 1962 | | | 1961 | | |
|-----------------------------|----------|-------------|-----------|----------|-----------|-------------|----------|-----------|-----------|
| | Quantity | Value | | Quantity | Value | | Quantity | Value | |
| | | Metric Tons | 1,000 Kr. | | US\$1,000 | Metric Tons | | 1,000 Kr. | US\$1,000 |
| Plaice | 60,000 | 98,000 | 14,210 | 57,379 | 91,480 | 13,265 | 53,176 | 87,094 | 12,629 |
| Cod | 69,000 | 59,000 | 8,555 | 62,904 | 51,443 | 7,459 | 65,539 | 54,268 | 7,869 |
| Herring and sprat | 267,000 | 75,000 | 10,875 | 272,900 | 80,607 | 11,688 | 267,416 | 79,301 | 11,499 |
| Pond trout | 8,000 | 61,000 | 8,845 | 7,838 | 56,790 | 8,235 | 7,662 | 53,037 | 7,690 |
| Other | 401,000 | 175,000 | 25,375 | 378,334 | 182,981 | 26,532 | 237,108 | 141,431 | 20,507 |
| Total landings | 805,000 | 468,000 | 67,860 | 779,355 | 463,301 | 67,179 | 630,901 | 415,131 | 60,194 |

1/Preliminary.
Note: One Danish krone equals about US\$0.145.

The development of FPC is a project sponsored by the Food and Agriculture Organization of the United Nations. It has been undertaken by many of the world's leading fishery research laboratories, including the station at Halifax. The program is prompted by a desire to supply underdeveloped nations with a cheap supply of animal protein. Also, dietetic studies showed that in Canada and the United States there is need for additional proteins in some diet formulations, especially for people engaged in heavy manual work, postoperative patients, and elderly people. One of the simplest uses of the product has been as an additive to bread and cereals.

* * * * *

ings were greater for cod (up 9.6 percent) and plaice (up 4.5 percent), but herring and sprat were down slightly from 1962.

A greater proportion of the 1963 landings than in 1962 was utilized by processors for fillets of flatfish and cod, and there were some increases from the previous year in the quantity of fish used for smoked and canned fish.

There also were some gains in the 1963 production of fish meal and oil as compared with the year earlier.

Denmark's exports of fish and shellfish during the year were up 10.2 percent from

Denmark (Contd.):

The value of Denmark's commercial fishing fleet and fishing gear and nets was higher in 1963 than in the previous year.

Denmark's per capita consumption of edible fishery products in 1963 rose to 16.0 kilograms (35.3 pounds) from 14.3 kilograms (31.5 pounds) in 1962. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 15, 1964.)

Note: See Commercial Fisheries Review, October 1963 p. 46; September 1963 p. 62.

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INDUSTRY VIEWS PRESENTED AT ANNUAL MEETING OF DANISH FISHERIES COUNCIL:

The annual meeting of the Danish Fisheries Council opened January 11, 1964, at Aarhus, Denmark. The Council was established in April 1954 by the leading Danish fishery organizations to present a single, united front in promoting and protecting the interests of the entire industry.

In opening the 1964 annual meeting, the Chairman recommended some consolidation

| Product | 1963 | 1962 | 1961 |
|---|---------------|-----------|-----------|
| | (Metric Tons) | | |
| Used by processors: | 1/180,000 | 1/135,918 | 1/120,058 |
| For fillets of flatfish and cod | 93,000 | 79,000 | - |
| For smoking | 6,500 | 6,200 | - |
| For canning | 17,000 | 15,000 | - |

1/Does not include fish meal and fish oil production.

| Byproduct | 1963 | 1962 | 1961 |
|---------------------|---------------|--------|--------|
| | (Metric Tons) | | |
| Fish meal | 90,000 | 88,200 | 57,900 |
| Fish oil | 25,000 | 24,500 | 17,300 |

1962 and the value increased 3.7 percent as compared with the previous year.

In 1963, there was a slight decline in the number of fishermen permanently engaged in Denmark's commercial fishery. There were also fewer fishermen in 1962 than in 1961. But the average annual gross income for 1962 increased 14.6 percent from 1961.

| Classification | 1963 | | | 1962 | | | 1961 | | |
|-----------------------------------|----------|-------------|-----------|----------|-----------|-------------|----------|-----------|-----------|
| | Quantity | Value | | Quantity | Value | | Quantity | Value | |
| | | Metric Tons | 1,000 Kr. | | US\$1,000 | Metric Tons | | 1,000 Kr. | US\$1,000 |
| Exports of fish and shellfish . . | 351,000 | 615,000 | 89,175 | 318,514 | 593,080 | 85,997 | 270,728 | 482,280 | 69,931 |
| Imports of fish and shellfish . . | 1/ | - | - | 163,544 | 166,811 | 24,188 | 126,343 | 123,919 | 17,968 |

1/Data not available.

| Type | 1/1963 | | 1962 | | 1961 | | |
|--------------------------------|--------|--------|-----------------------------|-------|--------|-----------------------------|-------|
| | Number | Number | Average Annual Gross Income | | Number | Average Annual Gross Income | |
| | | | Kroner | US\$ | | Kroner | US\$ |
| Fishermen: | | | | | | | |
| Permanently employed | 13,280 | 13,416 | 26,080 | 3,782 | 13,675 | 22,755 | 3,299 |
| Occasionally " | 4,370 | 4,343 | 1/ | - | 1/ | - | - |
| Total | 17,650 | 17,759 | - | - | 13,675 | - | - |

1/Data on income not available.

| Units | 1963 | | 1962 | | 1961 | |
|---------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Value | | | | | |
| | 1,000 Kr. | US\$1,000 | 1,000 Kr. | US\$1,000 | 1,000 Kr. | US\$1,000 |
| Fishing vessels | 454,000 | 65,830 | 437,877 | 63,492 | 416,890 | 60,449 |
| Fishing gear and nets | 117,000 | 16,965 | 108,816 | 15,778 | 102,798 | 14,906 |
| Type of vessel: | (Number) | | | | | |
| With motors | 1/ | | 8,350 | | 8,347 | |
| Without motors | 1/ | | 5,526 | | 5,692 | |
| Transporters | 1/ | | 22 | | 24 | |
| Total | - | | 13,898 | | 14,063 | |

1/Not available.

Denmark (Contd.):

of fisheries organizations, reaffirmed the need for an independent secretariat to work on market promotion, and suggested increased foreign contacts by industry and Government representatives. Discussing ex-vessel prices, the Chairman said that minimum prices for plaice, or any other species, should be worked out by fishermen with processors and exporters on a countrywide basis. He pointed out that the Council could serve as a link between the various groups.

Fishermen: The fishermen's representative stated that the 1963 catch was large but economic progress for fishermen was unsatisfactory. He declared that the considerable increase in the price of new and used fishing vessels made it difficult for young fishermen to acquire the capital needed to buy their own vessels.

Pointing out that fishermen own, alone or jointly, the greater part of the production capacity in Denmark, he called for more influence by fishermen on the processing and marketing of food fish. Bornholm fishermen have engaged in processing for years, and Esbjerg fishermen now are establishing two fillet plants. If the undertaking meets expectations--more stable ex-vessel prices--similar efforts will probably be made in other ports.

Exporters: The exporters' representative pressed for the fishing industry to take a joint position on market promotion, stating that with a joint effort new markets could be won and old ones maintained. He also said there should be a minimum size of 270 millimeters (10.63 inches) for plaice landed by fishermen. In Denmark, exporters normally combine processing and exporting.

Food-Fish Processing: The representative of this segment said that markets for fish fillets should be good in the coming year. He said that fishermen and processors, under the auspices of the Council, should establish a minimum price level for small plaice which would be fair to all concerned. This could lead to the solution of many other problems, including a minimum size limit for plaice. He said that the future will require close cooperation between fishermen and processors.

Retail Markets: The retailer's representative said there is a need for date mark-

ing of all frozen fish and fish products if customers are to be given the best possible service. Canned fish should indicate on the label the number of fish or pieces. An indication of the keeping quality--length of storage--should also be included. He also called for other changes in labeling practices.

Fish consumption was 35.2 pounds (round weight) per capita in Denmark in 1962. Despite ready access to superb fresh fish, including live plaice and eels, increasing quantities of frozen packaged fish are being marketed in Danish supermarkets and smaller stores with freezer cabinets.

Industrial Fish: A representative of the fish-meal factories said that fish meal and oil prices should be stable during the coming year. Many of the Danish factories have arranged forward sales of part of their production at good prices. Herring prices may reach 0.25-0.27 kroner a kilo (US\$32.95-\$35.59 a short ton) during the summer. And prices for sand eels may be about 0.20 kroner a kilo (\$26.36 a short ton). The Danish fish-meal industry should consider production of fat-free meal for feeding Danish swine; this offers a very large market. The need for buffer stock warehouses to handle possible overproduction was stressed.

About 45 percent of the Danish fisheries catch is used for producing fish meal and oil. This involves about 75 percent of the herring catch, much of the whiting and brisling landings, and all of the sand eel and Norway pout landings not consumed by other industrial uses such as feed for animals.

Fisheries Ministry: Representatives of the Danish Fisheries Ministry suggested that the small independent exporters consider some form of cooperation among themselves in order to meet the increasing competition of larger organizations. Although exports are at record levels, Ministry officials restated their concern over the difficulties small Danish exporters face in competing with large or integrated foreign fishery companies which can assist their outlets with financial and other merchandising assistance.

The Danish Fisheries Minister said he believed that all concerned had benefitted from the joint meeting. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 29, 1964.)



Dominican Republic

PRICES ON CANNED MACKEREL, CANNED TUNA, CANNED SARDINES, AND DRIED COD REDUCED:

An expanded market for canned mackerel (salmon style), canned tuna, canned sardines, and dried cod in the Dominican Republic should result from the reduced prices made possible by Dominican Law No. 34 of October 28, 1963, which freed those fishery products from import duties. The Dominican Bureau of Price Control then established new maximum prices as follows:

| Item | Unit | Maximum Selling Price Per Case by | | |
|--|--|-----------------------------------|------------|----------|
| | | Importer | Wholesaler | Retailer |
| (US\$) | | | | |
| Canned Fish: Mackerel (salmon style) | 48 8-oz. cans | 6.29 | 6.73 | 8.41 |
| Sardines: in tomato sauce | 100 5 ¹ / ₂ -oz. cans. | 8.02 | 8.58 | 10.73 |
| in olive oil | 100 4 ³ / ₈ -oz. cans. | 11.50 | 12.31 | 15.39 |
| Tuna in oil | 48 7-oz. cans | 8.10 | 8.67 | 10.84 |
| Dried Fish: Cod ("pollock") | 100 pounds | 24.60 | 26.32 | 32.90 |

The prices listed were contained in Bureau of Price Control Resolution No. 5, which was published in the Listin Diario of December 6, 1963. (United States Embassy, Santo Domingo, December 9, 1963.)



Fiji Islands

STATUS OF TUNA BASE:

Construction of cold-storage facilities at the joint Anglo-Japanese tuna base at Levuka, Fiji Islands, was reported in December 1963 to be 80-percent complete. They include a 60-ton capacity rapid-freezer unit, 2,000-ton capacity cold-storage plant, 30-ton ice-making plant, and a 600-ton capacity ice-storage facility.

The shore facilities are to be operated by the Pacific Fishing Company (PAFCO), which represents three Japanese firms and a local English firm. PAFCO will buy fresh tuna from the South Pacific Fisheries Cooperative Association, then freeze for export to the United States. The export quota for the base is 9,000 short tons of tuna.

The South Pacific Fisheries Cooperative Association is composed of 25 members from

the northern prefectures in Japan, 18 from Hokkaido alone. The Association was formerly organized in February 1962, with each member investing five million yen (US\$13,900). The Association owns 13 tuna vessels and plans initially to operate out of Levuka a combined total of thirty 99-ton tuna vessels in 1964. (Hokkai Suisan, December 23, 1963.)



German Federal Republic

DEVELOPMENTS ON NEW FISH REDUCTION METHOD:

The new German fish-reduction method, developed by the German inventor Heinz Doevenspeck of Bremen during early 1961, involves the use of electrophoresis and electrostriction to remove the cellular fluids from the tissue of fish and fish offal. The new method obviates the need for external heat, and permits the extraction of oil and raw protein at temperatures of not over 45 degrees centigrade (113° F.).

Knowledge of the new fish reduction method aroused considerable interest both in the United States and abroad, and the inventor has now furnished the following answers to a number of questions asked regarding his invention:

1. The process involves a discharge of condenser fields which produces the following three overlapping effects:
 - (a) It increases the electric potential (voltage) of the raw material which has passed through the electric field during the discharge.
 - (b) It produces electrostriction of the muscular cells which causes a change in volume and a pulse.
 - (c) It produces electroosmosis as well as electrostatic reaction, the latter destroying the so-called NERST electrostatic field between, for instance, the oily and watery phases of the raw material (ref: MILLIKAN tests).
2. (a) The potential gradient used in the electrical discharge is from 6,000 to 12,000 volts.
 - (b) It is a static discharge.
 - (c) It is not a damped oscillatory discharge.
 - (d) It is a pulsed discharge repeated approximately sixteen times per second.
 - (e) The energy involved in each discharge is 1,000 Joule (one Joule is the equivalent of one watt per second).

Doevenspeck stated that he has already obtained patents for his invention in Peru, France, and the South Africa Republic. His patent application dated February 1, 1961, filed in the South Africa Republic describes the invention in detail, but the inventor pointed out that it does not reflect the latest stage of development of his reduction method. Certain improvements have been achieved since early 1961, but he did not divulge further particulars because of the involvement of patent rights.

From the beginning of 1962 until about mid-1963, Doevenspeck's method of fish reduction was tested commercially under his management in a pilot plant erected by one of the largest West German trawler companies, which is a

German Federal Republic (Contd.):

leading producer of fish meal and fish oil in West Germany. According to the technical director of the trawling company's pilot plant, the tests were terminated because, in his opinion, the meal and oil yields obtained by the new method compared unfavorably with those obtained by conventional methods.

The inventor of the new fish reduction method later entered into a new contract with a firm in Cuxhaven which manufactured fish meal and an antibiotic poultry feed additive. He started a new pilot plant in the Cuxhaven factory during the summer of 1963 where he is now processing one metric ton of fish per hour with reportedly good results. He claims that his new reduction method was judged favorably by a professor of the Max Planck Institut fuer Ernaehrungs-Physiologie in Dortmund.

With regard to the commercial aspect of his invention, Doevenspeck maintains that the construction costs of his plant are about equal to those of a conventional fish meal plant, while his operating costs are about one-third less. He added that the principle of his invention may be applied to many other fields, e.g. sterilization, decontamination, etc. (United States Consulate, Bremen, December 20, 1963.)



Ghana

FISHERIES AGREEMENT WITH SOVIET UNION SIGNED:

On December 20, 1963, Ghana and the Soviet Union signed an agreement covering cooperation in the field of marine fisheries. The agreement was negotiated during the visit to Ghana of the Soviet Minister of the State Committee for the Fishing Industry. According to newspaper reports, the agreement covers the development of marine fisheries on a commercial scale, the training of Ghanaian fishermen in the Soviet Union, and the establishment of a joint commission to direct technical fishery assistance. The 6-member commission is to be composed of 3 representatives from Ghana and 3 from the Soviet Union.

In September 1963, a total of 92 Ghanaian students went to the Soviet Union for training in fishing techniques. Unconfirmed reports in December 1963 indicated that 88 more students from Ghana would go to the Soviet Union to begin a similar course.

In addition to providing large-scale training programs for Ghanaian fishermen, the Soviet Union has signed contracts to construct a complex of fish-processing factories at Tema and to supply 18 fishing vessels for the State-controlled Ghana Fishing Corporation. According to a statement made in late 1963 in the Ghana National Assembly, 10

of the 17 large fishing trawlers operating off Ghana are of Soviet registry. (United States Embassy, Accra, December 29, 1963.)

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IMPORT DUTY ON FISH AFFECTS JAPANESE AND RUSSIAN TRAWLING IN ATLANTIC OCEAN:

The six-pence (US\$0.0696) a pound duty on imports of fresh and frozen fishery products imposed by the Ghanaian Government on October 21, 1963, has greatly affected that part of the Japanese and Russian Atlantic trawling operations dependent on Ghana as an export market. Moreover, the duty is indirectly working a hardship on Ghanaian consumers since it has already brought about a sharp increase in retail fish prices, by as much as one-third.

Japanese fishing companies in December 1963 were negotiating the reduction of Ghana's high tariff. Also, in mid-December 1963, Soviet Fisheries Minister Ishkov was reported to have arrived in Ghana for the same purpose.

The Japanese fishing company, after the imposition of Ghana's high tariff, has begun to intensify its search for other possible new markets in Africa. Reportedly, that firm, together with a Nigerian and a North European firm, recently established a company in Nigeria called the Nigerian Frozen Foods Development Company. The Development Company has already undertaken the construction of a 1,000-ton capacity cold-storage plant. The plant, which is scheduled for completion in spring 1964, is being constructed so that it can readily be enlarged into a 4,000-ton capacity facility. (Suisancho Nippo, December 19 and 25, 1963.)



Greece

FREEZER-TRAWLER LANDINGS, JANUARY-OCTOBER 1963:

The Greek fleet of refrigerated trawlers and carrier vessels operating in the Atlantic landed 1,318 metric tons of frozen fish in Greek ports in October 1963, down 29 percent from landings of 1,858 tons in the same month of the previous year.

Greek frozen fish landings during January-October 1963 amounted to 15,670 tons, com-

Greece (Contd.):

pared with landings of 13,786 tons in the same period of 1962 and 11,331 tons in the first 10 months of 1961. The increase in landings in 1963 was partly due to an expansion of the Greek fleet of freezer-trawlers. (Alieia, November 1963.)

Note: See Commercial Fisheries Review, February 1964 p. 69.



Guatemala

COMMERCIAL FISHERY LIMITED IN 1963 BECAUSE OF LACK OF VESSELS:

The lack of a fishing port on Guatemala's Pacific Coast as well as an insufficient number of commercial fishing vessels were the major problems facing the development of that country's commercial fishing industry. That observation was made on December 17, 1963, by the Chief of the Department of Hunting and Fishing of Guatemala's Directorate General of Forestry, who felt that the shortage of fishing vessels caused smaller commercial landings of fish and shrimp during 1963. (Several fishing vessels were damaged or destroyed during severe Pacific storms in June 1963.)

The value of Guatemala's fishery products exports in 1962, consisting chiefly of shrimp exports to the United States, was US\$942,000.

With regard to vessels from other countries fishing in Guatemala's territorial waters, which extend 12 miles from shore and which are identical with her exclusive fishing zones, the Guatemalan official pointed out that foreign vessels must have licenses to fish within Guatemala's jurisdiction and must process the catch in Guatemalan ports. But he added that no such licenses were held by foreign fishing vessels. He also noted that some foreign fishing vessels were believed to be fishing illegally from time to time in Guatemalan waters but that Guatemala lacked an adequate coastal patrol fleet to police her waters. (United States Embassy, Guatemala, December 20, 1963.)



Ireland

JOINT JAPANESE-IRISH-FRENCH TRAWLING BASE:

A large Japanese fishing company, together with an Irish company and a French organization, are reported to be planning on establishing a joint trawl-fishing base at Galway, Ireland. The joint enterprise is to be established with a capital of 500,000 pounds (US\$1.4 million), with each participating firm contributing one-third of the investment. Reportedly, the Irish firm will provide the fishing base and shore-processing facilities, the Japanese firm will invest one 1,500-ton stern trawler, and the French group will undertake the construction of additional similar-type trawlers to be assigned subsequently to the base. Initially, the joint company will employ only one trawler, but plans call for eventual expansion of the trawl fleet to a total of six vessels.

Fishing will be conducted in the North Atlantic Ocean off Iceland principally for cod, and the catch is expected to be ship-frozen for export to Great Britain and other European countries. Ireland is reportedly seeking to have local fishermen conduct the fishing under Japanese guidance. (Minato Shimibun, December 21; Suisan Keizai Shimibun, December 19, 1963.)



Japan

FROZEN TUNA EXPORT PRICE TRENDS, JANUARY 1964:

The Japanese export frozen tuna market was reported to have softened somewhat in January 1964 as compared to December 1963. January 1964 c. & f. prices of frozen tuna exported directly to the United States from Japan proper are quoted as follows: gilled-and-gutted yellowfin US\$375 a short ton; round albacore \$380-385 a ton. They represent a decline in price of approximately \$10 a ton.

The average ex-vessel price of albacore in Japan is said to be 136-137 yen per kilogram (\$343-345 a short ton), showing a slight increase. The rise in price is attributed to indications that the Japanese packers will terminate tangerine packing earlier this year and begin packing albacore. They expected to begin tuna packing on a full-time basis by the end of January.

Japan (Contd.):

As of mid-January, Japanese-caught Atlantic Ocean albacore for export to the United States were selling for \$325-335 a short ton f.o.b. Las Palmas. (Suisancho Nippo and Suisan Tsushin, January 10, 1964.)

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**FROZEN TUNA EXPORT PRICES,
DECEMBER 1963:**

The Japanese export frozen tuna market was reported to have improved somewhat in December 1963, and the following prices (f.o.b. Japan) were reported for frozen tuna shipped to the United States from Japan proper: round albacore US\$340-345 a short ton; gilled-and-gutted yellowfin \$335 a ton.

In October 1963, the average f.o.b. export prices of frozen tuna were reported to be \$347 a ton for round albacore and \$309 a ton for gilled-and-gutted yellowfin. (Suisan Tsushin, December 26 and November 7, 1963.)

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**FROZEN TUNA EXPORTS TO THE
UNITED STATES, 1962-1963:**

Japanese frozen tuna exports (direct shipments and transshipments) to the United States in calendar year 1963 were down about 24 percent from those in the previous year. Direct shipments were down about 33 percent and transshipments were down 10 percent. The decline was due mainly to a drop

Table 2 - Japanese Exports of Frozen Tuna and Frozen Tuna Products to the United States, 1962

| Product | Direct Shipments | | Transshipments | | Total | |
|---------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|
| | Qty. Short Tons | Value US\$ 1,000 | Qty. Short Tons | Value US\$ 1,000 | Qty. Short Tons | Value US\$ 1,000 |
| Albacore 1/ | 20,718.8 | 7,496.7 | 20,048.7 | 7,004.8 | 40,767.5 | 14,501.5 |
| Yellowfin: | | | | | | |
| Round . . . | - | - | 664.8 | 150.2 | 664.8 | 150.2 |
| G. & G. 2/ | 36,272.9 | 12,197.9 | 8,377.0 | 2,516.8 | 44,649.9 | 14,714.7 |
| Dressed . . | 426.5 | 149.0 | 5,546.0 | 1,594.2 | 5,972.5 | 1,743.2 |
| Fillets . . . | 4,228.8 | 1,642.2 | 1,067.7 | 312.6 | 5,296.5 | 1,954.8 |
| Total . . . | 40,928.2 | 13,989.1 | 15,655.5 | 4,573.8 | 56,583.7 | 18,562.9 |
| Big-eyed: | | | | | | |
| Round . . . | - | - | 0.2 | 3/ | 0.2 | 3/ |
| G. & G. 2/ | 369.0 | 99.6 | 3.0 | 0.7 | 372.0 | 100.3 |
| Dressed . . | - | - | 1,129.1 | 258.4 | 1,129.1 | 258.4 |
| Fillets . . . | 29.0 | 9.0 | 195.0 | 42.3 | 224.0 | 51.3 |
| Total . . | 398.0 | 108.6 | 1,327.3 | 301.4 | 1,725.3 | 410.0 |
| Skipjack 1/ | 326.1 | 84.3 | 1,080.7 | 166.6 | 1,406.8 | 250.9 |
| Bluefin 4/ | 23.0 | 7.6 | 482.5 | 112.6 | 505.5 | 120.2 |
| Loins: | | | | | | |
| Albacore . . | 725.8 | 584.6 | - | - | 725.8 | 584.6 |
| Yellowfin . . | 3,865.7 | 2,800.7 | - | - | 3,865.7 | 2,800.7 |
| Big-eyed . . | 360.8 | 226.8 | - | - | 360.8 | 226.8 |
| Bluefin . . . | 133.4 | 89.6 | - | - | 133.4 | 89.6 |
| Total . . | 5,085.7 | 3,701.7 | - | - | 5,085.7 | 3,701.7 |
| Grand Total | 67,479.8 | 25,388.0 | 38,594.7 | 12,159.2 | 106,074.5 | 37,547.2 |

1/Round.
2/Gilled and gutted.
3/Less than \$500.
4/Fillets.

in exports of frozen yellowfin tuna. (United States Embassy, Tokyo, January 17, 1964.)

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FROZEN TUNA EXPORTS TO YUGOSLAVIA:

Japanese exports of frozen tuna to Yugoslavia for January-December 1963 totaled 12,465 metric tons, an increase of 63 percent

Table 1 - Japanese Exports of Frozen Tuna and Frozen Tuna Products to the United States, 1962-1963 1/

| Product | Direct Shipments | | Increase or Decrease | Transshipments | | Increase or Decrease | Total Shipments | | Increase or Decrease |
|-----------------|------------------|--------|----------------------|----------------|--------|----------------------|-----------------|---------|----------------------|
| | 1963 | 1962 | | 1963 | 1962 | | 1963 | 1962 | |
| | (Short Tons) | | % | (Short Tons) | | % | (Short Tons) | | % |
| Albacore . . | 15,525 | 20,719 | -25 | 23,127 | 20,049 | +15 | 38,652 | 40,768 | -5 |
| Yellowfin . . | 23,421 | 40,928 | -43 | 7,343 | 15,655 | -53 | 30,764 | 56,583 | -46 |
| Big-eyed . . | 31 | 398 | -92 | 285 | 1,327 | -79 | 316 | 1,725 | -82 |
| Skipjack . . . | 70 | 326 | -79 | 3,693 | 1,081 | +342 | 3,763 | 1,407 | +17 |
| Bluefin 2/ . . | - | 23 | -100 | 374 | 482 | -22 | 374 | 505 | -26 |
| Loins | 6,236 | 5,086 | +23 | - | - | - | 6,236 | 5,086 | +23 |
| Total . . . | 45,283 | 67,480 | -33 | 34,822 | 38,594 | -10 | 80,105 | 106,074 | -24 |

1/Exports in 1963 only include shipments to Canada. The quantity shipped to Canada is thought to be about 1.0 percent of the total.
2/Fillets.

Japan (Contd.):

over 1962 exports, which totaled 7,631 metric tons. The 1963 export price averaged US\$377 a metric ton c.i.f., and reached a high of \$470 a ton. Average export price in 1962 was \$370 a ton. (Suisan Tsushin, January 10, 1964.)

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CANNED TUNA IN BRINE
SALES TO UNITED STATES:

The Japan Canned Foods Exporter Association announced on December 18, 1963, that a total of 110,000 cases of canned tuna in brine for export to the United States would be offered at the first canned tuna sale of the new export year, but did not specify the quantity of white meat or light meat to be sold. (The new export year started December 1963.) Closing date for offers was set at December 22, with shipments to be made not later than February 22, 1964. Export prices per case (No. $\frac{1}{2}$ 7-oz. 48's) are US\$10.40 for white meat tuna and \$7.80 for light meat tuna, both prices f.o.b. Japan. The sale of 4-pound cans of light meat tuna in brine is expected to be limited to a total of 12,000 cases of both A and B grade packs due to light supply. (Suisancho Nippo, December 19, 1963.)

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CANNED TUNA IN OIL EXPORTS,
APRIL-OCTOBER 1963:

Data compiled by the Japan Canned Foods Exporters Association indicate that Japanese canned tuna in oil exports for April-October 1963 totaled 1,260,000 cases, an increase of 500,000 cases over the same period of 1962. October exports alone amounted to 260,000 cases. Principal countries of destination were reported as West Germany (430,000 cases) and Canada (160,000 cases). (Suisan Keizai Shimbun, December 26, 1963.)

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JAPANESE COMMENT ON
CANNED TUNA MARKET TRENDS:

The Japan Canned Foods Exporters Association recently announced that because of low supply it would offer in the new market year at the first sale of canned tuna for export to the United States only a limited quantity of institutional-pack (4-lb.) light meat canned tuna. The Association is said to have received reports that institutional-pack light meat tuna is in very short supply in the Unit-

ed States. Reportedly, regular institutional-pack users, such as hotels, restaurants, and schools, are said to be finding it difficult to purchase 4-pound canned light meat tuna, and this has stimulated demand for that product.

On the other hand, canned white meat tuna, U. S. and Japanese, are said to be in abundant supply in the United States, with prices holding firm following a brief period of decline. The Canned Foods Association believes that, depending on strategy employed, it may be possible during the Lenten season to clear up the 800,000-1,000,000 cases of Japanese canned white meat tuna inventory carried over from 1963. (Suisancho Nippo, January 9, 1964.)

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CANNED TUNA PROMOTION IN
UNITED STATES:

A total of US\$250,000 has been budgeted for canned tuna promotion in the United States during the 1964 Lenten season by the Japan Canned Tuna Packers Association. This brings the total amount budgeted for canned tuna promotion in FY 1963 (April 1963-March 1964) to a total of US\$500,000. Reportedly, based on Japanese production, this is equal to an assessment of approximately US\$0.20 per case. This action was decided at a meeting of the Association on January 18. The Packers Association expected to meet with the Exporters Association to work out promotional details. (Suisan Tsushin, January 21, 1964.)

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HIGH PRICES PAID FOR
FRESH TUNA IN TOKYO MARKET:

A record 3,700 yen per kilogram (US\$4.66 per pound) was paid on January 4, 1964, at the Tokyo Central Fish Market for a 188-pound trap-caught bluefin tuna. This was equivalent to \$9,320 a short ton. On the same day, a prime fresh big-eyed tuna sold for 2,000 yen a kilogram (\$5,040 a short ton) and a prime yellowfin 1,500 yen a kilogram (\$3,780 a short ton).

In December 1963, fresh prime bluefin frequently sold for prices ranging from \$2.00-3.50 a pound (equivalent to \$4,000-7,000 a short ton). The high prices were attributed to the short supply of prime fresh tuna for the sashimi (raw fish) trade and the strong holiday demand. (Suisan Keizai Shimbun, January 5, 1964, and other sources.)

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Japan (Contd.):

EASTERN BERING SEA MOTHERSHIP BOTTOMFISH AREAS FOR 1964:

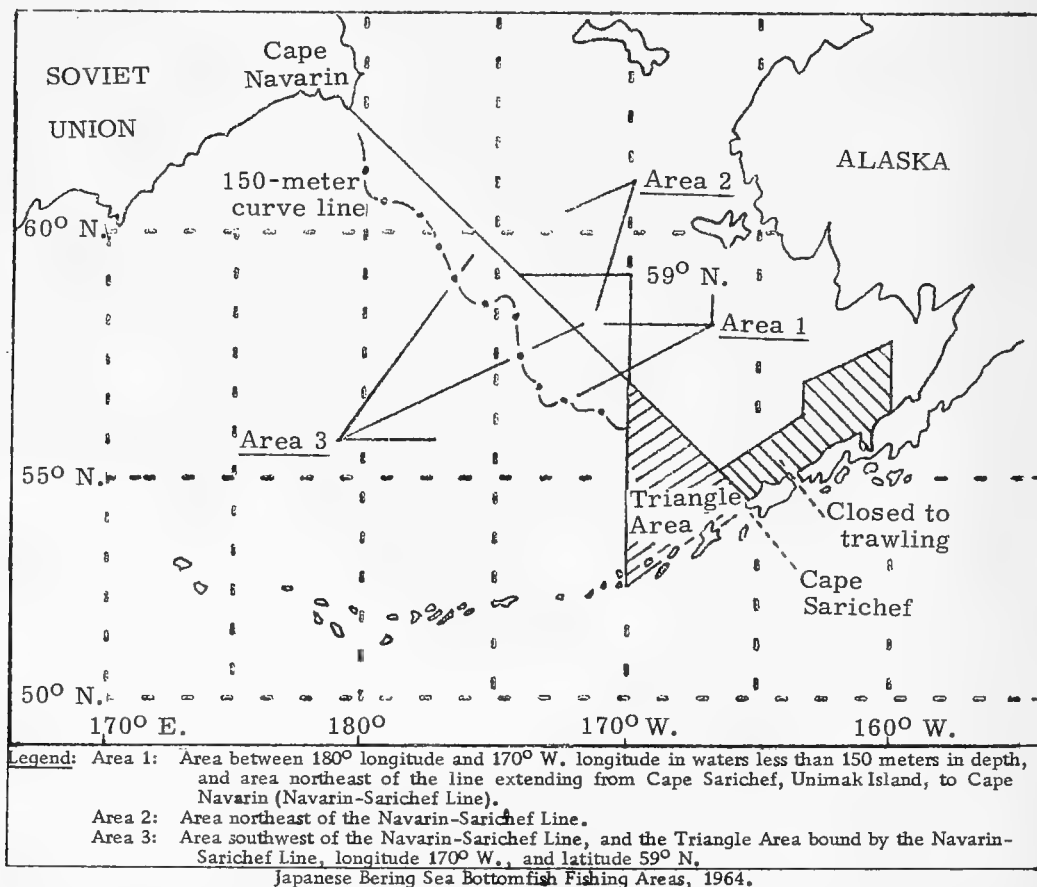
The regulatory program proposal submitted by Japan's Fisheries Agency on the licensing and operation of mothership-type bottomfish fleets in the eastern Bering Sea in 1964 was reviewed and approved by the Japanese Central Fisheries Coordination Council on December 13, 1963. The main features of the 1964 regulatory program as contrasted to the 1963 regulations are: (1) reduction in bottomfish mothership fleets from a total of 19 to 14, and in catcher vessels from 252 to 228; (2) revival of a fishing firm's fish-meal operations; (3) simplification in area licensing system; and (4) relaxation of fishing restrictions, e.g., fleets permitted to operate over wider area.

Although the 1964 mothership-type bottomfish fleet has been reduced by a total of 5 motherships and 24 catcher vessels, the fishing capability of the fleet apparently has not been

reduced due to the use of larger motherships and catcher vessels, not to mention the addition to the fleet of 2 large stern trawlers (Ibuki Maru and Taiyo Maru No. 82), which also will be serving as motherships.

In 1963, the 19 bottomfish motherships totaled 90,917 tons in gross weight. The 14 bottomfish motherships licensed to operate in the eastern Bering Sea in 1964 total 94,609 tons in gross weight, an increase of 3,692 tons.

The firm which pioneered the development of the mothership-type fish-meal operation in the Bering Sea and which voluntarily completely curtailed its Bering Sea fish-meal operation (two factoryships) in 1963 due to heavy financial losses it suffered in 1962 and in earlier years, has been authorized to revive its meal operation. The firm plans to use the 14,094-ton factoryship Renshin Maru. However, the operation of that firm's fish-meal fleet has been restricted to an area considered not as lucrative as the area assigned to one other company's fish-meal fleet.



Japan (Contd.):

The 1964 area licensing regulations have been simplified through the establishment of only three fishing areas. In 1963 the Fisheries Agency had established eight fishing zones in the eastern Bering Sea, which were designated by letters, as A, B, CF, DF, E, etc. As in 1963 there is considerable overlapping in the 1964 fishing areas.

The 1964 area licensing regulation, in summary, reads:

1. One mothership under 12,000 gross tons, accompanied by 30 catcher vessels of sizes 50-550 tons, shall be permitted to operate in the area between 180° longitude and 170° W. longitude in waters less than 150 meters in depth, and in the area northeast of the line extending from Cape Sarichef, Unimak Island, to Cape Navarin (Navarin-Sarichef Line).
2. One mothership under 15,000 gross tons, accompanied by 30 catcher vessels of sizes 50-550 gross tons, shall be permitted to operate northeast of the Navarin-Sarichef Line.
3. A total of 12 motherships, accompanied by a total of 168 catcher vessels of sizes 50-550 gross tons, shall be permitted to operate in the area southwest of the Navarin-Sarichef Line, and in the triangle area northeast of that line bound by said line and longitude 170° W. and latitude 59° N.
4. The area bound by the following lines shall be closed to trawling: Line extending from the northern coast of Alaska Peninsula

at 160° W. longitude to the point 160° W. longitude-58°10' N. latitude, and connecting the points 160° W. longitude-58°10' N. latitude; 163° W. longitude-57°10' N. latitude; 163° W. longitude-56°20' N. latitude; and extending from the point 163° W. longitude-56°20' N. latitude to the Navarin-Sarichef Line through the point 164° W. longitude-56° N. latitude.

For purposes of identification, the areas described in items 1 to 3 have been arbitrarily designated as Areas 1, 2, and 3. Fishing areas assigned to the 14 mothership fleets, their complement, type of operation, etc., as reported in several Japanese periodicals, are shown in table. The table does not include the Japanese mothership-type king crab fleet licensed to operate in Bristol Bay or a fishing company's two 1,500-ton stern trawlers (Akebono Maru Nos. 51 and 52) which operate independently in the eastern Bering Sea.

The operational plans submitted by the Japanese fishing companies planning to operate mothership-type bottomfish fleets in the eastern Bering Sea show several noteworthy trends. Those trends are: (1) decline in the number of long-line vessels and switchover to trawl vessels; (2) increase in size of catcher vessels; and (3) the use for the first time of large (over 2,500 tons) stern trawlers as motherships.

In 1963, the fleets operating long-line vessels, and particularly those which concentrated on fishing for halibut, reportedly had a poor season, whereas those which operated trawl gear had a successful season. Long-lining prospects for 1964 are considered poor, and catcher vessels operating long lines in 1964 are expected to total substantially less

Composition of Japanese Bering Sea Mothership-Type Bottomfish Fleet, 1964

| Area of Operation | Mothership | Size Gross Tons | No. Catcher Vessels | Type of Operation | Period of Operation |
|-------------------|---|--------------------|---------------------|-------------------|------------------------------|
| Area 1 | <u>Gyokuei Maru</u> ^{1/} | 10,357 | 30 | Fish meal | Early April to early October |
| Area 2 | <u>Renshin Maru</u> | 14,094 | 30 | Fish meal | Early April to early October |
| Area 3 | <u>Tenyo Maru</u> ^{1/} | 11,581 | 28 | Trawl | Late April to early October |
| Area 3 | <u>Soyo Maru</u> ^{1/} | 11,192 | 28 | Trawl | Late April to early October |
| Area 3 | <u>Shikishima Maru</u> ^{1/} | 10,144 | 24 | Trawl | Early May to early October |
| Area 3 | <u>Seifu Maru</u> ^{1/} | 8,269 | 28 | Trawl-longline | Late April to late September |
| Area 3 | <u>Einin Maru</u> ^{1/} | 7,482 | 15 | Trawl | Early April to early October |
| Area 3 | <u>Chichibu Maru</u> ^{1/} | 7,420 | 12 | Shrimp | Year round |
| Area 3 | <u>Itsukushima Maru</u> ^{1/} | 5,871 | 18 | Trawl-longline | Early April to early October |
| Area 3 | <u>Taiyo Maru No. 82</u> ^{2/} | 2,890 | 1 | Trawl | Mid-May to mid-October |
| Area 3 | <u>Ibuki Maru</u> ^{2/} | 2,500 | 1 | Trawl | Starts mid-March |
| Area 3 | <u>Chichibu Maru No. 22</u> ^{2/} | 1,693 | 8 | Trawl | Early May to late October |
| Area 3 | <u>Kotoshiro Maru No. 152</u> ^{2/} | 701 | 3 | Trawl-longline | Early April to late October |
| Area 3 | <u>Seisho Maru No. 2</u> | 415 | 2 | Trawl-longline | Unknown |

^{1/}Motherships which operated in Bering Sea in 1963.

^{2/}Stern Trawlers.

Japan (Contd.):

than half the some 90 vessels which used that type of gear in 1963. As of mid-January 1964, operational plans submitted to the Fisheries Agency by the mothership companies indicated that about 20 catcher vessels will fish long lines this year. On the basis of that information, it appeared that at least four mothership fleets (Sifu Maru, Itsukushima Maru, Kotoshiro Maru No. 15, and Seisho Maru No. 2) will be fishing for halibut in the Triangle Area.

Although trawlers were much more successful than the long-line vessels, they had their share of difficulties in 1963, particularly the smaller druggers, because of bad weather early in the season. It became readily apparent that to operate successfully, larger trawlers would have to be used and the Fisheries Agency, in anticipation of that trend, apparently has placed a ceiling for the first time on the size of trawlers (maximum size 550 tons) that can be used as catcher vessels. As far as could be determined, there were no maximum size restrictions in previous years.

The trend towards using larger trawlers is seen, for example, in the case of one fishing company, in particular. In 1963, that company's mothership Chichibu Maru No. 2 operated with 80-ton class catcher vessels. During 1964 that mothership will be served by trawlers about 300 tons or over in size.

Operational plans of the different fleets at the beginning of 1964 further revealed that all fleets were planning to leave for the fishing grounds after early April. In 1963, a large percentage of the 19 fleets departed for the fishing grounds in March, and 1 or 2 of them left earlier, but many vessels lost fishing time due to bad weather during the early part of the season.

With regard to the operation of large stern trawlers, the Japanese Fisheries Agency had expressed the view in 1963 that, on the basis of available information, it appeared the operation of a mothership-type trawl fleet, composed of a large stern trawler fishing with several small trawlers, appeared to be the most efficient and economical way to fish the eastern Bering Sea. This year, for the first time, two stern trawlers over 2,500 tons (Ibuki Maru and Taiyo Maru No. 82), each fishing with a smaller trawler, are scheduled for operation.

In addition to those two large trawlers, another fishing company which has operated the two 1,500-ton stern trawlers Akebono Maru, Nos. 51 and 52, in the eastern Bering Sea for several years, is planning to replace them this fall with two 3,500-ton stern trawlers, which are now under construction and scheduled for completion in August 1964. (Japanese fishery periodicals.)

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FISH-MEAL OPERATION IN EASTERN BERING SEA PLANNED:

The application of a Japanese fishing company to revive its fish-meal operations in the eastern Bering Sea is said to have been unofficially approved by the Fisheries Agency.



Japanese fish-meal factoryship Renshin Maru.

The company plans to assign the fish meal factoryship Renshin Maru (14,094 gross tons) to that operation. (Suisan Tsushin, January 10, 1964.)

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PLANS FOR 1964 TRAWLER OPERATIONS IN EASTERN NORTH PACIFIC OCEAN:

The Japanese Fisheries Agency is reported to have informally approved the applications of two fishing companies to operate trawlers in the eastern North Pacific Ocean in 1964. It is reported that 1 of the 2 firms plans to operate a 1,500-ton trawler and the other firm a 500-ton trawler. Four other fishing companies which operated trawlers in the eastern North Pacific in 1963 are reported to be planning on using larger vessels in 1964. (Suisancho Nippo, December 23, 1963.)

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FUTURE OF DISTANT-WATER TRAWL FISHERIES:

Production Chief Shunichi Oguchi of the Japanese Fisheries Agency made the following comments regarding the future of Japan's distant-water trawl fisheries:

Japan (Contd.):

Waters off West Africa: At the present time, Japanese trawlers are operating mainly in the waters off northwest Africa and, as a result, their catches must necessarily be landed at Las Palmas (Canary Islands). An important problem of the future is the expansion of new market outlets. As they are developed, they will lead to the gradual development of fishing grounds further to the south.

There is also need to develop the operational efficiency of trawl operations. In the past, the large trawlers hauled their catches back to Japan, but, at the present time, their catches are being transhipped to Japan. There should be further experimentation in making a clear separation between fish-catching and fish-transporting activities. If this is done, the trawl fishery off Africa can be developed further.

Northwest Atlantic: One large Japanese fishing company is operating the *Tenyo Maru* (3,500 gross tons) on an experimental basis but the Northwest Atlantic is an area fished by trawlers of many nations. Problems will be created if Japan should enter into competition with those countries in markets on which they are heavily dependent. Thus, Japan is presently collecting data on markets on which those nations are less dependent, mainly the United States.

Caribbean Sea: One Japanese firm operated one trawler *Aoi Maru*, 1,104 gross tons) in the Caribbean Sea on an experimental basis. Due to the vast area involved, there is still much to be learned about that area.

Waters off Argentina: For some time now we have had our eyes on those waters. However, due to the great distance of those grounds from Japan and to restricted market outlets, they have not been explored. This year two firms are conducting experimental fishing in those waters but it will be necessary for them to develop markets in Europe. Success of developing the grounds off Argentina will depend on finding market outlets.

Waters off New Zealand and Australia: They are not very attractive to fishermen, probably due to the lack of suitable fishing bases nearby. Those waters will continue to lack appeal unless suitable measures are developed with regard to catching and transporting fish.

Eastern North Pacific Ocean: Operation of Japanese trawlers in the waters southeast of the Alaska Peninsula is hindered by the fear (held by the United States and Canada) that halibut may be taken incidentally to other bottom-fish. However, Japanese trawlers are taking almost no halibut in their nets, so there is room to expand further fishing effort in those waters.

Should we be provided with a share of the halibut catch, as we have been insisting at the treaty (United States-Canada-Japan) negotiations, and should this result in the establishment of restricted areas and in the prohibition of trawling operations, as in the Bering Sea, this will create problems. Our vessels will not be able to operate profitably if restricted areas to trawling should be established. It is not possible to visualize the future of this fishery without a clear idea of the outcome of the treaty negotiations. (*Suisan Keizai Shimbun*, January 1, 1964.)

FISH-FREEZING OPERATIONS OFF ANGOLA PLANNED:

Preliminary discussion on the establishment of Japanese fish-freezing operations off Angola held between a Japanese fishing firm and Angolan Government officials were reported to have shown promise. The presi-

dent of the Japanese firm was planning on leaving for Angola in mid-January 1964 for the purpose of completing the plans. The Japanese firm plans to operate off Angola a 6,800-ton freezer factoryship and 5 pairs of two-boat trawlers. (*Suisan Tsushin*, December 24, 1963.)

WHALE OIL AND MEAT PRODUCTION, 1962/63 SEASON:

Japan's 1962/63 season's catch of whales produced 166,400 metric tons of oil and 168,323 tons of meat, according to whaling industry officials.

Table 1 - Japanese Whale Oil Production by Area, 1962/63 Season

| Area | Baleen | Sperm | Total |
|---------------------|---------------------------|--------|---------|
| | (Metric Tons) | | |
| Coastal | 2,500 | 8,000 | 10,500 |
| North Pacific | 11,966 | 20,320 | 32,286 |
| Antarctic | 113,334 | 10,380 | 123,614 |
| Total | 127,800 | 38,600 | 166,400 |

Table 2 - Japanese Whale Meat Production by Area, 1962/63 Season

| Area | Baleen | Sperm | Total |
|---------------------|---------------------------|-------|---------|
| | (Metric Tons) | | |
| Coastal | 10,000 | 1,200 | 11,200 |
| North Pacific | 20,052 | 2,000 | 22,052 |
| Antarctic | 133,987 | 1,084 | 135,071 |
| Total | 164,039 | 4,284 | 168,323 |

It was estimated that the 1963/64 season's catch for the Japanese whaling fleet operating in the Antarctic would produce 117,000 metric tons of whale oil and 125,000 tons of meat. The yield of other products e.g. bone meal, viscera, liver oil, and skin was not included in the information furnished by the Japanese whaling industry. (Fisheries Attache, United States Embassy, Tokyo, January 7, 1964.)

BALEEN WHALE OIL SALES BY JAPANESE WHALING FIRMS:

Japanese whaling firms, which late in 1963 concluded the sale of 14,000 metric tons of baleen whale oil at £82 (US\$229.60) per metric ton, are reported to have been offered £83 (\$232.40) per metric ton by an independent fat-and oil-processing firm. (*Suisancho Nippo*, December 26, 1963.)

ESTABLISHMENT OF FOREIGN-BASED WHALING OPERATIONS STUDIED:

Japanese whaling firms are reported to be actively conducting feasibility studies on the

Japan (Contd.):

establishment of foreign-based whaling operations. The studies are being undertaken to cope with the problem of fully utilizing their whaling vessels in the future in view of the likelihood that the international whale-catch quota will be further reduced. This would, in turn, necessitate a reduction in their Antarctic whaling operations. The Japanese firms appear to be primarily interested in establishing whaling bases in African and South American countries. In 1963, Japanese whaling operations were established for the first time in South Georgia Island in the South Atlantic Ocean. One Japanese firm was reported to be planning on establishing whaling operations in Chile in early 1964. (Suisan Keizai Shimbun, December 19, 1963.)

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LICENSES TO OPERATE TWO WHALE CATCHER VESSELS OFF CHILE ISSUED:

Licenses were issued to a Japanese whaling company by Japan's Fishery Agency permitting it to operate two whale catcher vessels to hunt sperm whales in waters off the coast of Chile, according to the vice president of the whaling firm. The vessels are the No. 3 Ryhuo-Mar (429 gross tons) which arrived on the fishing grounds on December 31, 1963, and the No. 2 Seiho-Mar (306 gross tons) which was scheduled to join the other vessel on January 29, 1964. The licenses specify an operating period of about four months.

The whaling company official said that the catch target is 1,000 sperm whales, all of which are to be purchased by a Chilean firm which manufactures fish meal and oil. He stated further that the catcher boats will not make delivery to the land stations; instead, delivery to the Chilean firm will be made at sea. (United States Embassy, Tokyo, December 30, 1963.)

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SPANISH TRAWL-CAUGHT FISH IMPORTED BY JAPANESE FIRM:

A Japanese fishing firm which has a five-year contract with Spain to purchase fish from Spanish trawlers based in the Canary Islands, imported 1,000 metric tons of Spanish-caught fish in January 1964. The fish, which are being transported to Japan on a Spanish vessel, consist mainly of "monko" squid and sea

bream. It was the third shipment of fish that the Japanese firm imported. A fourth shipment, also of 1,000 tons, was scheduled for delivery in February.

In September 1963, the Japanese firm imported 200 tons of trawl-caught fish on a trial basis, and in October it imported 4,000 tons. The second shipment was transported to Japan by that company's 8,500-ton freezer factoryship, the Awazu Maru. (Suisancho Nippo, December 21, 1963.)

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EXPORTS OF FISHERY PRODUCTS, APRIL-SEPTEMBER 1963:

Data on Japanese exports of fishery products for FY 1963 (April 1963-March 1964) released by the Japanese Ministry of International Trade and Industry on December 9, 1963, indicate that exports during the first half of the fiscal year (April-September) totaled US\$127,790,000. Exports of canned fishery products for the six months totaled 4,850,580 cases, valued at US\$46,384,000, and exports of frozen fishery products totaled 83,221 metric tons, valued at \$30,374,000. (Nihon Suisan Shimbun, December 11, 1963.)

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NUMBER OF SMALL VESSELS TO FISH IN NEW OFFSHORE TUNA FISHERY:

The Japanese Fisheries Agency announced on December 19, 1963, that at the recommendation of the Central Fisheries Coordination Council a total of 1,850 tuna vessels in the 20- to 50-ton class will be licensed to operate in the newly designated offshore tuna fishery (north of 10° N. latitude and west of 160° E. longitude). Vessel owners planning to engage in that fishery must submit their applications between December 25, 1963, and March 24, 1964. The Agency had earlier, on December 7, stopped receiving applications for permits to construct 39-ton tuna vessels. (Suisan Tsushin, December 20 and 27, 1963.)

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FISHING VESSEL CONSTRUCTION, JANUARY 1964:

On January 20, 1964, the Japanese Fisheries Agency licensed the construction of 23 fishing vessels (gross tonnage 12,695 tons). Included are 8 tuna fishing vessels of the following size classes: 250 tons, three; 192 tons, four; and 111 tons, one. The Agency also au-

Japan (Contd.):

thorized the construction of three large stern trawlers, one of 1,850 tons and two of 2,530 tons; and two 1,800-ton freezer vessels. (Suisan Keizai Shimbun, January 23, 1964.)

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PERMITS ISSUED BY FISHERIES AGENCY FOR VESSEL CONSTRUCTION, DECEMBER 1963:

The Japanese Fisheries Agency issued permits on December 16, 1963, for the construction of 46 fishing vessels. They included seven tuna long-line vessels: 1 vessel of 99 tons, 2 of 192 tons, one 300-ton tuna long-line training vessel, and one 888-ton portable-boat-carrying tuna mothership (Takamiya Maru), plus two 19-ton portable boats.

On December 26, the Agency issued construction permits for 96 fishing vessels. They included 22 tuna long-line vessels: one 19-ton portable boat, 5 vessels between 96-111 tons, eight 192-ton long-liners, and 8 vessels ranging in size from 253-324 tons. The Agency also authorized the construction of three 3,470-ton stern trawlers. (Suisan Keizai Shimbun, December 18 and 28, 1963.)

One of Japan's largest fishing companies has under construction two 2,800-ton stern trawlers, Taiyo Maru Nos. 81 and 82. The Taiyo Maru No. 81 was scheduled for completion in late February 1964, and was expected to be sent to the eastern North Pacific Ocean. (Suisancho Nippo, December 25, 1963.)

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BOTTOMFISH LONG-LINE FISHERY OFF NEW ZEALAND PLANNED:

A total of 17 Japanese fishing companies (including 6 tuna vessel owners) have submitted to the Fisheries Agency applications for permits to operate bottomfish long-line fleets in the waters directly north of North Island, New Zealand.

The 17 companies are planning on operating 300- to 1,000-ton vessels which would not directly engage in fishing but would deck-carry 1- to 2-ton unpowered boats which would do the actual fishing. The mothership fleets would fish about ten months of the year, except June and July, principally for red sea bream.

The interest of the Japanese fishing firms to engage in long-lining for red sea bream off New Zealand is based on the following reasons: (1) the distant-water mothership-type bottomfish long-line fishery, not to mention the distant-water trawl fishery, is one of the few remaining fisheries that can still be exploited and which shows promise; (2) fishing licenses are not presently required to engage in that fishery; (3) employment of tuna vessels retired from the tuna fishery and long-line vessels presently engaged in the Bering Sea bottomfish fishery is possible; (4) low cost of gear investment; (5) long-line gear fished at the bottom is highly selective, as revealed by experimental fishing conducted in New Zealand waters in 1961, thus making it possible to harvest red sea bream almost exclusively; and (6) ready market for red sea bream in Japan, which commands a high price. Current market price for red sea bream (heads-on) in Japan is quoted at about 150,000 yen (US\$417) a metric ton, and is said to be comparable to that for dressed halibut.

The Fisheries Agency hopes to prevent severe gear competition on the New Zealand grounds. At the present time, the New Zealand offshore trawl fishery is regulated by the Agency as a "designated (licensed) fishery" but the bottomfish long-line fishery is not, and the Agency is said to be studying the possibility of regulating the long-line fishery as a "designated fishery." For the present, the Agency is said to be planning on restricting the operation of bottomfish long-line fleets to a total of 5 or 6 fleets. (Suisan Keizai Shimbun, January 10, 1964.)

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HIGH SPEED ENGINES FOR FISHING VESSELS RECOMMENDED:

The Japanese Fisheries Agency plans to install a high-speed Diesel engine in its new fishery research vessel Naikai Maru (80 gross tons) scheduled to be built in Fiscal Year 1964 (April 1964-March 1965) to determine its adaptability to Japanese fishing vessels. High-speed engines, widely used in fishing vessels of western countries, are not presently used on Japanese fishing vessels.

The recommendation for installation of high-speed engines in fishing vessels was made by officials of the Fisheries Agency and the Japan National Federation of Fishery Co-operative Associations, who during their tour of Europe in November 1963 observed that high-speed engines installed on fishing vessels resulted in considerably reducing manpower

Japan (Contd.):

requirements. For example, a crew complement can be reduced to 4 or 5 on a 60-ton Japanese fishing vessel presently manned by 12-13 crew members. Other advantages are: (1) engineroom area can be reduced to allow more space for fish holds; and (2) engine operation can be controlled entirely from the wheelhouse. Possible disadvantages are: (1) high-speed engines must be replaced as a unit, whereas low-speed engines can be repaired in enginerooms, and (2) shorter period of serviceable life. (Suisancho Nippo, January 9, 1964.)



Mauritius Island

JAPANESE TUNA TRANSSHIPMENT BASE AT PORT LOUIS:

The Japanese Overseas Company, which manages the tuna fishing base at Penang, Malaysia, has established an advance tuna transshipment base at Port Louis, Mauritius Island, in the western Indian Ocean, following approval granted by the Japanese Government on November 22, 1963. The Overseas Company presently has one 300-ton refrigerated vessel and one 400-ton carrier vessel based at that port, and hopes eventually to contract a total of 30 ice boats to fish out of its bases at Penang and Port Louis. At the present, five ice boats are operating out of Port Louis. Their ice supply is being transported to Port Louis from Penang. (Suisan Keizai Shimbun, December 26, 1963.)



Morocco

CANNED SARDINE MARKET TRENDS, 1963:

Morocco's 1963 sardine landings were reported as disappointing despite continuation of fishing operations beyond the season's normal closing at the end of September 1963. Spokesmen for the Moroccan fishing industry's merchandising organization and individual canners were inclined to blame the current sardine shortage on unusually bad weather conditions off the coast. Further observations were that the local fishing fleet is increasingly centered at Safi and Agadir and is handicapped in the search for more

productive fishing grounds by limitations imposed by obsolescent boats and gear. Another explanation in connection with the present sardine shortage was the Moroccan fisherman's traditional reluctance to go long distances from the home port.

It was reported by authoritative sources that the canned sardine export program to which the industry is committed will exhaust inventories by April 1964.

The local industry has for some time been concerned with the static quality of its markets and the extent to which its narrow overall margin of profit depends on the duty-free import quota of 685,000 cases accorded by France. For these reasons, stocks on hand will be fully utilized in an effort to meet commitments, with the franc market favored if supplies run out.

Exports of canned sardines for the first four months of the season, June-September 1963, totaled 728,542 cases (100 cans No. $\frac{1}{4}$ -4.5-oz.), compared with 733,574 cases in the same period of 1962. Of that total, 38.5 percent went to France, 22 percent to the other Common Market countries and Algeria, 14 percent to African countries which were formerly French territories, and the balance largely to Nigeria and other African markets in the sterling zone.

The target for the 1963 canned sardine pack was about 2,400,000 cases. Since exports tend to be fairly evenly spaced over the 12 months, with relatively little seasonal variation, the shortage expected to develop in April and May 1964 before new supplies become available can be estimated at 250,000 to 300,000 cases which is likely to be withheld from the West German and Italian markets.

The Moroccan canned sardine is a quality product packed for export under rigid control standards. But under present merchandising policies it has to compete in world markets on the basis of price rather than quality. The implicit disadvantage to that system is reflected in the fact that sales to any but the French market are at cost, if not at a loss. Various domestic considerations, including the large-scale unemployment elsewhere in the Moroccan economy, contribute to high prices for fish delivered to the canneries and high costs for labor in processing. While the Portuguese canned sardine industry is re-

Morocco (Contd.):

garded locally as the principal competitor determining world market prices, there is held to be no present prospect and little future prospect of meeting such competition. The exception might perhaps be the establishment of a much larger market than at present in the United States by packing a smaller sardine to meet United States consumer preferences.

The Norwegian brisling is by contrast not regarded by the Moroccan industry as being a competitor in quality terms except in the United States. The Moroccan industry would like to imitate certain Norwegian methods, especially in fishing operations, but considers that the capital investment required to modernize the fishing fleet is unavailable until more extensive markets are developed. (United States Consulate, Casablanca, December 11, 1963.)

Note: See Commercial Fisheries Review, January 1964 p. 64.



Netherlands

ANTARCTIC WHALING RESULTS, EARLY 1963/64 SEASON:

The management of the Netherlands Whaling Company in Amsterdam has released preliminary data on its 1963/64 Antarctic whaling expedition in which its factoryship, the Willem Barendsz, participated with 11 catcher vessels. The vessel started operations in the Antarctic on December 12, 1963, and up

Table 2 - Netherlands Whaling Company Production in Antarctic, December 12, 1963 to January 5, 1964

| Product | Season | |
|--|---------------------------|---------|
| | 1/1963/64 | 1962/63 |
| | (Metric Tons) | |
| Whale oil | 1,421 | 3,742 |
| Sperm oil | 1,058 | 1,225 |
| Meat meal | 199 | 465 |
| Frozen meat and liver . . | 176 | 140 |
| Frozen meat for Japanese refrigerator vessel | 1,226 | 2,802 |

1/Preliminary.

At a stockholders meeting of the whaling company early in 1964, proposals were advanced to discontinue hunting for whales and to use the factoryship for another purpose, such as general fishing off the South American and African coasts. No decisions were made on the proposal.

As far as is known, 16 whaling expeditions were operating in the Antarctic during the 1963/64 season as compared with 17 in the previous season. They were the Netherlands with 1 factoryship, Norway 4, U.S.S.R. 4, and Japan 7.

Higher prices for fish meal and fish oil during the 1962/63 season resulted in a production value for the Netherlands Whaling Company of Fl. 13.1 million (US\$3.6 million) as compared with Fl. 12.3 million (\$3.4 million) in the previous season. This included the whaling company's share of the Japanese vessel's (Awazu Maru) operations which accompanied the expedition and froze 7,285 pounds of whale meat for the United Kingdom. It was reported that the Japanese vessel would again work with the Netherlands expedition during the 1963/64 season. The 1962/63 sea-

Table 1 - Whale Products Produced by Netherlands Whaling Company in Antarctic and Average Prices Per Ton, 1961/62 and 1962/63 Seasons

| Product | 1962/63 Season | | | 1961/62 Season | | |
|---|----------------|------------------------------|------|----------------|------------------------------|------|
| | Metric Ton | Average Price Per Metric Ton | | Metric Ton | Average Price Per Metric Ton | |
| | | Fl. | US\$ | | Fl. | US\$ |
| Whale oil | 10,463 | 656 | 182 | 12,084 | 401 | 113 |
| Sperm oil | 2,905 | 867 | 241 | 2,915 | 769 | 214 |
| Whale-meat meal | 1,261 | 561 | 156 | 1,742 | 550 | 153 |
| Frozen whale meat | 795 | 779 | 216 | 1,220 | 808 | 224 |
| Whale liver | 344 | 905 | 251 | 417 | 909 | 253 |
| Other whale products ^{1/} | 60 | - | - | 31 | - | - |
| Whale meat for Japanese refrigerator ship | 7,285 | - | - | 7,936 | - | - |

^{1/}Whale bones, sperm whale teeth.

to January 5, 1964, the results were considered very disappointing. The data given in table 2 show the production as of January 5, 1964, as compared with the same period in the previous season.

son was reported to have closed with a loss of about \$400,000 to the Netherlands whaling expedition. (United States Consulate, Amsterdam, January 2 and 16, 1964.)

Note: See Commercial Fisheries Review, June 1963 p. 83.



Norway

CANNED FISH EXPORTS, JANUARY 1-OCTOBER 26, 1963:

Norway's total exports of canned fish in January 1-October 26, 1963, were 8.5 per cent less than in the same period of 1962. The decline affected all of Norway's principal canned fish products. There was a particularly sharp decline in shipments to the United States due in large part to the recovery of the Maine sardine industry which recaptured a good part of the United States market for canned sardines.

| Norwegian Exports of Canned Fish, January 1-October 26, 1962-63 | | |
|--|---------------------|--------|
| Product | 1/1963 | 1962 |
| | .. (Metric Tons) .. | |
| Brisling | 4,437 | 5,100 |
| Small sild | 11,779 | 12,010 |
| Kippered herring | 2,570 | 3,576 |
| Soft herring roe | 672 | 739 |
| Sild delicatessen | 396 | 439 |
| Other canned fish | 2,702 | 2,646 |
| Shellfish | 1,272 | 1,544 |
| Total | 23,328 | 26,054 |
| 1/Preliminary. | | |

In 1963, the small sild-canning season opened on May 2. By November 23, 1963, the small sild pack amounted to 679,717 standard cases, compared with 663,283 cases in the same period of 1962.

The 1963 brisling packing season extended from June 4 to October 15. At the close of the 1963 season, a total of 282,039 standard cases of canned brisling had been packed, a decline of 32.5 percent from the pack of 417,918 cases in the previous year. The Norwegian brisling catch was rather poor in the fall of 1963.

The production of canned mackerel up to November 16, 1963, amounted to 1,577 metric tons, compared with 2,194 tons by the same date in 1962. (Norwegian Cannery Export Journal, December 1963.)

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FISHERIES LANDINGS AND EXPORTS, 1963:

Norway's fisheries landings in 1963 amounted to 1,138,105 metric tons with an ex-vessel value of Kr.685 million (US\$96 million), according to preliminary estimates. The 1963 landings were up about 1.8 percent in quantity and 3.0 percent in value from those in the previous year.

Norwegian exports of fishery products in 1963 were valued at Kr. 970 million (US\$136 million), an increase of Kr. 25 million (US\$3.5 million) from those in 1962. (News of Norway, January 9, 1964.)



Pakistan

NEW FISH-PROCESSING PLANT ESTABLISHED AT KARACHI:

A new fish-processing plant in Karachi, Pakistan, was to start processing fishery and fishery byproducts by March 1964. The plant is built along modern lines with the latest freezing and processing facilities for processing shrimp, fish fillets, and other fishery products, as well as the manufacture of shark-liver oil.

The Karachi fish harbor and market was built by the Pakistan Government and started operating in late 1959. Since then it has become an important fisheries center and has given impetus to the growth of West Pakistan's fisheries. A certain amount of space at the market area was set aside for private industry and as of the end of 1963 a number of firms have located there with processing equipment to freeze, can, and dry fish, and also extract shark-liver oil.



Poland

TRAWLING OPERATIONS IN THE NORTHWEST ATLANTIC:

Polish factory-trawlers operating in the Northwest Atlantic off Newfoundland and Labrador in 1963 reported average daily catches of 31 metric tons. One of the vessels caught 6,400 metric tons of cod, ocean perch, and flatfish in 1963. The Polish trawlers began deep-water operations in 1963, operating at depths of 550 to 700 meters (1,800 to 2,300 feet.) (Polish Maritime News, December 1963.)

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TRAWLING OPERATIONS OFF NORTHWEST AFRICA:

In early November 1963, the Polish factory trawler Pegaz landed 1,270 metric tons of fish at Tema, Ghana. The Pegaz and 11 Polish mo-

Poland (Contd.):

tor trawlers are based at Tema, Ghana, where their catch is landed and sold. The vessels are said to be taking good catches from fishing grounds off Northwest Africa. (Polish Maritime News, December 1963.)

**Portugal****AFRICAN TRAWLING FLEET MAY BE SERVICED BY MOTHERSHIP:**

Portuguese trawlers operating off Northwest Africa have recently had to move farther south to find fish. The added distance and lack of refrigeration on the fishing vessels has created problems. Now, however, the Gil Eanes, a refrigerated supply ship, will be available to pick up the catch of the African fleet during part of the year. In the past, the Gil Eanes has been used exclusively to service the Portuguese Northwest Atlantic cod-fishing fleet of about 75 vessels. The supply ship has normally remained in the Northwest Atlantic about six months each year providing equipment and welfare services to the 6,000 fishermen of the cod fleet. New legislation (Decree-Law No. 45,496) enacted December 30, 1963, makes the Gil Eanes available for charter to other registered vessel operators when it is not working in the Northwest Atlantic. (United States Embassy, Lisbon, January 20, 1964.)

**Rumania****TWO NEW FREEZER STERN TRAWLERS ORDERED FROM JAPAN:**

The Rumanian state-owned fishing industry is planning to extend its operations into the western Atlantic Ocean (off Newfoundland) and into the equatorial Atlantic (off the West African coast) in 1964. Two large stern trawlers have been ordered from Japanese shipyards at Hitachi, the first of which was scheduled for delivery in December 1963. The second vessel will be delivered some time during 1964. The vessels are 305 feet long with a displacement of 3,800 gross tons and a speed of 13 knots. They will have a freezer-hold capacity of 58,269 cubic feet and a fish-meal-hold capacity of 18,187 cubic

fleet. The vessels will be capable of remaining at sea 100 days. (Le Marin, November 15, 1963.)

**South Africa****TUNA COMPANY EXPANDING FISHING FLEET:**

In late 1963, a South African tuna-fishing company was negotiating in Copenhagen, Denmark, for the purchase of 2 more ocean-going vessels at a cost of R220,000 (US\$306,680). The new vessels will each have a refrigerated storage capacity of 60 to 70 tons of fish. The South African company was formed in Cape Town in mid-1963. It began tuna fishing operations off the west coast with the Marinette, a converted refrigerated cargo vessel which was outfitted for both long-line and pole-and-line fishing. The success of the Marinette led to the negotiations for the new vessels. (South African Fishing News and Shipping Industry Review, November 1963.)

Note: See Commercial Fisheries Review, November 1963 p. 78.

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FISH MEAL EXPORT QUOTA FOR 1964 INCREASED:

A 1964 fish meal export quota of 300,000 short tons has been assigned to South Africa (including South-West Africa) by the Fish Meal Exporters' Organization (FEO). This is 75,000 tons above South Africa's 1963 export quota. (In late October 1963, FEO met in Lima, Peru, and assigned 1964 fish meal export quotas for its five member countries--Angola, Iceland, Norway, Peru, and South Africa.)

In 1963, South Africa produced about 120,000 tons of fish meal while the Territory of South-West Africa produced about 140,000 tons, for a total of 260,000 tons. Only about 25,000 tons were consumed domestically, leaving 235,000 tons available for export.

South-West Africa's fish catch quota, which is set by the Government, has been increased from 600,000 tons in 1963 to 720,000 tons this year, and it is expected that the Territory's factories will again emphasize fish-meal production. (Fish canned, in contrast, was cut back from just over 2,000,000 cases in 1962 to 1,900,000 cases in 1963.) The increased

South Africa (Contd.):

quota from FEO will help absorb any surplus resulting from the larger catch.

About 60 percent of South African and South-West African estimated fish-meal production for 1964 has already been sold on future contracts at prices slightly above current rates, according to the chairman of the South African Fish Meal Producers' Association. Selling has now been stopped to await market developments. (United States Consul, Cape Town, January 14, 1964.)



South-West Africa

PILCHARD SEASON IN 1963 SETS RECORD:

The last of the six pilchard-processing factories at Walvis Bay in South-West Africa completed operations during the second week of November 1963. This was the best pilchard season yet at Walvis Bay with more than 600,000 short tons of raw fish landed.

The approximate production at Walvis Bay during the 1963 season was: fish meal, 140,000 short tons (an all-time record)--last season the production was 95,000 short tons; fish oil, 4 million imperial gallons--was less than in 1962 when the record production reached 4.5 million gallons.

The canned fish pack dropped in 1963 to 1.9 million cases in comparison with just over 2 million cases in the 1962 season.

Most of the factories were expected to start the 1964 season during February. The total South-West African pilchard quota for 1964 will be 720,000 short tons. (The South African Shipping News and Fishing Industry Review, December 1963.)



Spain

FISHERIES DEVELOPMENT PLAN, 1964-1967:

The Spanish Government's comprehensive Economic and Social Development Plan for 1964-1967 went into effect January 1, 1964. The Plan places heavy emphasis on investments as the key to increased output and productivity.

The main goals for the Spanish fishing industry in the 4-year Plan are: (1) improve the fishing fleet by replacing 44,000 metric tons of obsolete vessels with 42,000 tons of new construction--vessels less than 25 years old are expected to make up 453,000 gross tons of the Spanish fleet in 1967; (2) to equip fishing harbors; and (3) to modernize the fish-canning and preserving industries, improve fish marketing, and increase consumption of fishery products.

Spanish canned production in 1967 is expected to be 60.9 percent greater than in 1962; domestic consumption of canned fishery products should be 41.5 percent above the 1961 level, and exports should be 134.9 percent above 1961.

Salted fish production should increase by 50 percent during the 1962-1967 period. It is hoped that production costs will decline with greater mechanization and expanded capacity.

A special plan has been designed for the Canary Islands calling for an annual growth rate of 11.6 percent in the fisheries of that territory. (United States Embassy, Madrid, January 3, 1964.)

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FISHERY TRENDS AT VIGO AND LA CORONA, OCTOBER-DECEMBER 1963:

Vigo Landings and Prices: Fishery landings at the port of Vigo, Spain, in October-December 1963 totaled 20,599 metric tons valued at 268.3 million pesetas (US\$4.5 million), a considerable decline from third quar-

Table 1 - Landings and Average Ex-Vessel Prices of Selected Species at Vigo, October-December 1963 with Comparisons

| Species | 1963 | | | | | | 1962 | | |
|------------------|------------------|---------------|----------|----------------|---------------|----------|------------------|---------------|----------|
| | October-December | | | July-September | | | October-December | | |
| | Quantity | Average Price | | Quantity | Average Price | | Quantity | Average Price | |
| | Metric Tons | Pesetas/Kilo | US\$/Lb. | Metric Tons | Pesetas/Kilo | US\$/Lb. | Metric Tons | Pesetas/Kilo | US\$/Lb. |
| Small hake . . . | 4,675 | 25.50 | 19.3 | 4,550 | 25.45 | 19.3 | 2,363 | 25.79 | 19.5 |
| Sardines . . . | 3,359 | 8.09 | 6.1 | 4,414 | 7.07 | 5.4 | 5,066 | 6.53 | 4.9 |
| Horse mackerel | 3,034 | 4.14 | 3.1 | 4,394 | 3.33 | 2.5 | 4,777 | 4.61 | 3.5 |

Spain (Contd.):

ter 1963 landings of 30,122 tons valued at 404.4 million pesetas (US\$6.7 million), and fourth quarter 1962 landings of 25,428 tons valued at 245.8 million pesetas (US\$4.1 million).

Table 2 - Distribution of the Fishery Landings at Vigo, October-December 1963 with Comparisons

| Period | Shipped Fresh to Domestic Markets | Canned | Other Distribution (Smoking, Drying, Fish Meal, etc.) |
|-------------------------|-----------------------------------|--------|---|
|(Metric Tons)..... | | | |
| 4th Quarter 1963 | 12,020 | 5,364 | 3,215 |
| 3rd Quarter 1963 | 13,786 | 10,117 | 6,219 |
| 4th Quarter 1962 | 12,882 | 7,115 | 5,431 |

A drop in landings at Vigo during the last three months of the year is expected. The end of the albacore season and dwindling sardine landings are the main reasons for the decline, but other species are also affected. The offshore fleet is often inactive in winter because of bad weather.

Total fishery landings at Vigo during 1963 were up 15.8 percent in quantity and 41.7 percent in value from 1962 (which was also a record year).

Table 3 - Fishery Landings at Vigo, 1959-63

| Year | Quantity | | Value | |
|------|-------------|---------------|-----------|--|
| | Metric Tons | 1,000 Pesetas | US\$1,000 | |
| 1963 | 91,882 | 1,261,424 | 21,036.8 | |
| 1962 | 79,344 | 890,449 | 14,850.0 | |
| 1961 | 74,810 | 723,033 | 12,058.0 | |
| 1960 | 65,457 | 660,645 | 11,017.6 | |
| 1959 | 75,179 | 759,661 | 12,668.9 | |

La Coruna Landings and Prices: Fishery landings at the port of La Coruna in 1963 were reported to be about 75,000 metric tons (including cod landings) with an ex-vessel value of almost 1,200 million pesetas (US\$20.0 million). About 11,000 metric tons of the La Coruna 1963 landings were sold to canneries, and about 70 percent of the landings (excluding cod) were shipped fresh to domestic markets.

Canned Fish Industry: Difficulties were reported in the canned fish industry at Vigo and La Coruna during October-December 1963. Canned fish production was down considerably from that in the preceding quarter as well as from that in the fourth quarter of 1962 (table 2). All canneries were said to have large stocks on hand. A serious decline in canned fish exports has been only partly offset by improved domestic sales. There

is a growing sense of concern among all but the strongest firms.

Some relief may be obtained if the Government authorizes the export of canned fish packed in peanut oil. However, it is thought that the industry needs a thorough reorganization, including new machinery and equipment, new production methods, and possibly some consolidation of producers. (United States Consul, Vigo, January 16, 1964.)

Note: 59.96 Spanish pesetas equal US\$1.00.



Taiwan

FISHERIES TRENDS, 1963:

Production: Taiwan's fisheries production in 1963 was up 7.2 percent from that in 1962. The increase in production from deep-sea fisheries was mainly due to a good trawling

Taiwan's Fisheries Production, 1962-63

| Type of Fishery | 1963 | 1962 |
|---------------------------------|---------|---------|
|(Metric Tons)..... | | |
| Offshore and deep-sea fisheries | 119,880 | 113,595 |
| Inner coastal fisheries | 144,023 | 132,525 |
| Outer coastal fisheries | 36,854 | 32,286 |
| Fish culture | 49,972 | 48,640 |
| Total | 350,729 | 327,046 |

catch, and the addition of 12 tuna long-line vessels constructed under a loan extended by the Taiwan Joint Commission on Rural Reconstruction (JCRR). Increases in coastal fisheries were due to good runs of fish and the growth of a motorized fleet of small vessels. The drop in production from fish culture was the result of the summer drought and the cold weather in the spring which killed many fish.



Two of Taiwan's new 210-ton tuna long-line vessels sail on their maiden voyage.

Taiwan (Contd.):

Artificial Hatching of Carp: In July 1963, three species of Chinese carp (*Hypophthalmichthys molitrix*, *Aristichthys nobilis*, and *Ctenopharyngodon idellus*) were given pituitary hormone injections to stimulate spawning. The majority of the eggs obtained from the hormone-treated fish were fertilized and hatched normally and the young fish obtained by that method grew normally. It appears that this may be an economical way to solve the difficult problem of hatching carp. Chinese carp fingerlings had to be imported from Hong Kong in past years.

Artificial Hatching of Mullet: The grey mullet (*Mugil cephalus*) is an important pond fish in Taiwan, but fingerlings for stocking local ponds must be captured in coastal water, and the supply is often inadequate. In December 1963, a team of fish culturists tried to fertilize eggs obtained from ripe mullet captured off the southern coast of Taiwan. The male and female mullet were first given hormone injections. The eggs obtained by stripping were fertilized with milt from the male and hatched in 60 hours. However, all the fry thus obtained died in 2 or 3 days. The experiment will be continued in late 1964 when mullet start their spawning migration off the southern coast of Taiwan. (T. P. Chen, Chief, Fisheries Division, Joint Commission on Rural Reconstruction, Taiwan.)
Note: See Commercial Fisheries Review, April 1963 p. 74.



U. S. S. R.

NEW SERIES OF FREEZER-TRAWLERS UNDER CONSTRUCTION IN DENMARK:

The M/S Grumant, the first of the new series of four identical freezer-trawlers ordered from a Copenhagen shipyard by V/O Sudoimport, of Moscow, was launched December 18, 1963. The contract for the 4 vessels amounts to a total of Kr.95 million (US\$13.7 million), and calls for delivery in 1964. The M/S Grumant was built as a refrigerator ship to dress and freeze catches taken aboard from accompanying trawlers. However, it also may be operated as a stern trawler. Specifications are as follows: length between perpendiculars 91 meters, breadth 16 meters, depth to upper deck 8.6 meters, deadweight (approximate) 2,550

metric tons, draft (approximate) 5.52 meters, speed on loaded trials 14.0 knots. The Grumant is driven by a 6-cylinder Diesel engine developing 3,530 horsepower at 200 r.p.m.; auxiliary power is provided by three 6-cylinder and one 3-cylinder Diesel engines.

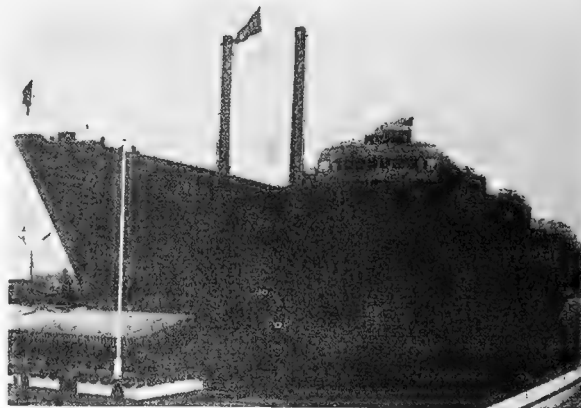


Fig. 1 - Bow view of M/S Grumant at construction dock.

The M/S Golfstrim, the second vessel of the new series, was launched on January 16, 1964.



Fig. 2 - Stern of M/S Grumant. Note chute for hauling aboard trawl catches.

An earlier series of 4 identical vessels was delivered by the Copenhagen shipyard to V/O Sudoimport in November 1962 and January, June, and September 1963. The first series of four vessels had identical specifications to the M/S Grumant and M/S Golfstrim, except that the individual tonnage of the earlier vessels was given as 2,600. It was also stated that the first series of vessels would freeze fish only and not do any trawling.

U. S. S. R. (Contd.):

The M/S Grumant has propulsion machinery as well as the refrigerating plant located amidships, with large refrigerated cargo holds fore and aft. The entire superstructure is arranged amidships. The stern includes a large chute for taking catches aboard.

The rigging consists of two pairs of self-supporting derrick posts. On the superstructure, there is a self-supporting combined signal and radar mast. The derricks (four 3-ton and two 7-ton) are served by four 3-ton and two 5-ton winches. The deck machinery also includes an anchor winch, two 3-ton warping winches, and one 15-ton trawl winch.

Construction time for the M/S Grumant, from keel laying to the assembly of the final section, was only 15 working days. This was 4 days faster than the 19-day record set in constructing the M/S Vitrus Bering, of the first series, in June 1962. The M/S Grumant was built in five main sections--keel, section forward of mast, bow, stern and superstructure--which were welded ahead of time, held in the section warehouse, and then assembled in a drydock. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 22, 1964.)

Note: See Commercial Fisheries Review, Sept. 1962 p. 71.

* * * * *

NEW POLISH-BUILT FACTORYSHIP DELIVERED:

A well known Copenhagen ship and engine builder announced on December 2, 1963, that 1 of its engine licensees, a shipyard in Gdansk, Poland, had delivered the first of a series of 11 factory vessels (a new type known as B-64) to the Soviet fishing fleet.

The new vessel is intended to fulfill the function of a factory-base ship on the Atlantic grounds in close cooperation with fishing fleets. In addition to processing and storing fish, the factoryship will (1) supply fishing flotillas with oil, water, fishing gear, and provisions; (2) render technical assistance to fishing units; (3) render social and medical service to fishing vessel crews; and (4) command the whole fishing fleet while operating on the fishing grounds.

The dimensions of the vessel are: length (over-all) 542 feet, breadth 69 feet, depth to

main deck 31 feet, depth to shelter deck 41 feet, deadweight tonnage 10,000 metric tons, gross tonnage 9,250 tons, and net tonnage 3,660 tons.

The vessel is driven by a 5-cylinder Diesel engine which develops 6,250 horsepower at 115 r.p.m. Service speed was reported as about 14 knots.

The vessel has holding areas with the following capacity: cold-storage holds 10,530 cubic meters, provisions chambers 300 tons, fuel oil tanks 46,660 cubic meters, fresh water tanks 1,900 cubic meters, oil tanks 200 cubic meters, and cod-liver oil tanks 230 cubic meters.

The vessel has a shelter-deck design with a long forecastle, superstructures fore and aft, and single compartment unsinkability. Processing is carried out between decks. Fresh fish is received on the vessel in net bags (floating cod ends) that are pulled up the stern ramp by two-ton winches. Catches may also be transferred from fishing vessels alongside by derricks of 5-ton and 10-ton capacity. Fuel oil and water for fishing vessels are carried in deep tanks and double bottom tanks. The stern upper-deck superstructure has space for an airplane or a helicopter. The hull is reinforced for navigation in ice. All holds are equipped to store frozen fishery products at -25° C. (-13° F.). Both the mooring and anchoring appliances are adapted to anchor the vessel in deep water. Special aids will allow simultaneous mooring of four fishing vessels alongside the mothership. It has accommodations for 248 persons in single, 2- and 4-berth air-conditioned cabins. The vessel is equipped to provide medical service to fishing fleet crews. The vessel carries 2 salt-water evaporators with a total capacity of 100 tons per day to provide fresh water for a fishing fleet.

The vessel's refrigeration equipment has the capacity to : (1) freeze 100 tons of fish per day in blast-freezing tunnels; (2) produce 20 tons of flake ice per day; (3) maintain a temperature of -25° C. (-13° F.) in all holds; (4) maintain appropriate temperatures in provisions chambers; and (5) maintain required air-conditioning.

Two processing rooms on the main deck can handle 200 tons of fish per day. Six fully mechanized processing lines are designed to produce fish fillets, herring preserves, and

U. S. S. R. (Contd.):

salted herring. Fish-processing equipment includes filleting machines and canning machinery. The 3 herring processing lines have a capacity of 50 tons each 22 hours. There is a fish reduction unit with daily capacity of 100 tons. The cod-liver oil plant can produce 5 tons of oil daily. Fish products are mechanically conveyed from the processing rooms to storage holds. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 15, 1964.)



United Arab Republic

FISH CANNING:

The only important fish cannery in the United Arab Republic is located near the mouth of the river Damietta (branch of the Nile) on the Mediterranean Coast in the town of Ezbet el Borg. The cannery, which became fully operative late in the spring of 1962, includes a can manufacturing section and a fish meal and oil processing unit. At present, the plant is concentrating on sardine canning. From September to November, the Mediterranean sardine season, the factory receives sardines directly from fishing vessels arriving at the company's dock. During the rest of the year, fresh sardines are trucked from Suez.

The factory is fully equipped to handle all stages of sardine canning. The canning equipment was manufactured and installed by a Japanese firm. Japanese technicians assisted at the initial pilot production, but present operations are under the supervision and maintenance of Egyptian engineers working in the plant. All operations are done by machine, except for cutting the fish and filling the cans which are manual. The plant employs about 400 full-time workers. This includes 300 women who process the fish on the production lines.

Canned sardine production during fiscal year 1964 is expected to reach 15,000 metric tons or about 7 million 4.4-oz. cans, compared with 2.5 million cans in FY 1963. The large increase in sardine production is expected because of the smoothing out of earlier production difficulties, and to the fact that facilities formerly devoted to crab and shrimp canning will be available for work on sardines.

The plant processes "musa," a small fish taken along with sardines. Production figures are inexact because "musa" is considered a byproduct of the sardine industry, but the manager expected that about 1 million 4.4-oz. cans of "musa" would be processed during FY 1964 for retailing on the local market at 5 piasters (11.5 U.S. cents) per can.

Although sardines are canned chiefly for domestic consumption, small amounts are being exported to Ghana, the Congo, and Kuwait. No increase in those exports is expected in the immediate future.

A total of 750,000 3.5-oz. cans of shrimp were produced during FY 1963. Shrimp are not being processed this year. The company has been exporting about 500,000 cans of shrimp each year to East Germany, and will continue to do so until stocks are exhausted. The resumption of shrimp production is not planned unless a firm export market develops.

The cannery produced 30,000 7-oz. cans of crab during FY 1963. No crab production was reported for FY 1964. All crab production is consumed locally.

The company will process 100,000 2-oz. cans of anchovies during FY 1964.

The plant management is considering importing frozen tuna from Japan for canning. Negotiations for machinery are under way, and the plant laboratory is conducting feasibility research. If arrangements are successful, the factory plans to produce 300,000 3-1/2-ounce cans and 200,000 7-1/2-oz. cans of tuna annually.

According to the plant management, the possibility of exporting canned shrimp to the United States is being discussed with a shellfish company in Mississippi. The Mississippi company would supply the empty cans, and then buy the canned shrimp packed at the Egyptian factory.

Retail prices on the local Egyptian market are:

| Item | Unit | Price | |
|-------------------|-------------|--|------|
| | | (Piasters $\frac{1}{1}$) (U.S. Cents) | |
| Shrimp | 3.5-oz. can | 15 | 34.5 |
| Crab | 7.0-oz. can | 20 | 46.0 |
| Sardine | 4.4-oz. can | 5.5 | 12.7 |
| Musa | 4.4-oz. can | 5 | 11.5 |

1/One Egyptian piaster equals US\$0.023.

The Damietta cannery is well organized and managed. The equipment on the premises is well maintained. Elimination of hand operations by introduction of more automatic machinery would make the processing more economical, but such expansion must await the availability of foreign exchange. (United States Consulate, Port Said, January 24, 1964.)



United Kingdom

FISHERY LOANS INTEREST RATES REVISED:

The British White Fish Authority announced that effective November 16, 1963, their rates of interest on loans for fishing vessels of not more than 140 feet, new engines, nets and gear would be as follows: on loans for more than 5 years but not more than 10 years, $5\frac{5}{8}$ percent (increase $\frac{1}{8}$ percent); on loans for more than 10 years but not more than 15 years, $5\frac{5}{8}$ percent (increase $\frac{1}{4}$ percent); on loans for more than 15 years but not more than 20 years, $5\frac{7}{8}$ percent (increase $\frac{1}{4}$ percent).

The rates on loans made before November 16 are unchanged.

Note: See Commercial Fisheries Review, January 1964 p. 71.

* * * * *

TRAWLER FISHERMEN GET MORE PAY AND ADDITIONAL PAID HOLIDAYS:

More pay and additional paid holidays for British trawler fishermen were issues agreed upon at a meeting in London of the National Joint Industrial Council which represents vessel owners and unions in the British fishing industry. The new pay agreement was to become effective November 25, 1963. The fishermen are getting an extra one shilling

United Kingdom (Contd.):

(14 U. S. cents) on the basic rates, and three more paid holidays bringing the annual holiday leave up to 24 days.

After the meeting, an employee spokesman who is also National Fishery Officer of the Transport and General Workers' Union (TGWU) stated that the leave agreement was among the best negotiated in British industry. A Fleetwood official of TGWU described the increase as not being as much as they had expected but that it was a step in the right direction.

At Aberdeen, an official of the Aberdeen Fishing Vessel Owners' Association said the increased rate will cost trawler owners there another £20,000 to £25,000 (US\$56,000 to \$70,000), or about £250 (\$700) per vessel. He added that the fishermen had wanted 28 days leave but that under the new agreement they would get 24 days leave with pay.

Vessel owners in Lowestoft were expected to hold a meeting before the pay increases became effective in order to discuss the implications of the decisions made at the November London meeting.

At Hull, the pay increase will affect about 3,000 fishermen. Also, about 2,500 workers employed either on the Hull Fish Market or in dock-processing establishments were to get a shorter working week with increased minimum rates of pay. Effective on April 6, 1964, the working week will be reduced from 44 hours to 42 hours. This was based on agreements negotiated between the Hull Fish Merchant's Protection Association and Union representatives. New minimum pay rates were to be effective in the first full pay week following November 11, 1963. Minimum pay rates for men 20 years of age and over were to be increased by seven shillings (98 U. S. cents), with proportionate increases for youths and boys. Separate classifications of skilled and unskilled for women have been combined, and the new rate for women 20 years of age and over will be £6 10 shillings (\$18.20) a week, with proportionate increases for those under 20 years of age. (Fishing News, November 15, 1963.)

* * * * *

BOXING-FISH-AT-SEA TESTS CARRIED OUT BY TRAWLER:

The British trawler St. Britwin was slated to return to her home port of Hull in Decem-

ber 1963, following a fishing trip in which fish-boxing tests aboard the vessel were carried out. On this experimental trip the vessel also carried aboard, in addition to her normal crew, members of the White Fish Authority's Industrial Development Unit who were sponsoring the boxing-fishing-at-sea tests.

There have been occasional experiments in fish boxing aboard distant-water trawlers but these have been on a relatively small scale and have had as their primary aim an assessment of the quality of boxed fish. Now, as the scope of the boxing at sea is becoming enlarged, the purpose of this bigger scale work is to gain practical experience of what is entailed both at sea and in port unloading operations.

It is stressed, however, that on this occasion, neither the type of box to be used nor the method of marketing, involving as it will sample weighing, will necessarily be the final procedure to be adopted.

The present practice of conventional distant-water trawlers is to stow catches in ice in the fish hold but a report on the subject has pointed out advantages which the extension of the boxing technique would give.

Boxing fish at sea, it was stated, besides cutting out considerable intermediate fish handling, would have the further advantage of preventing the earlier and later parts of a vessel's catch being accidentally mixed during unloading.

In discussing the present boxing experiments, the head of the Industrial Development Unit expressed appreciation of the help which the Torry Research Station, the Humber Laboratory of the Department of Scientific and Industrial Research, and others were giving on the tests.

"One of the advantages of boxing fish," he said, "is that it enables fish to be displayed in more or less the order in which it has been caught." (Fishing News, November 15, 1963.)

* * * * *

NEW FROZEN FISH THAWING UNIT:

A new thawing plant operating at Grimsby, England, is an essential part in a plan to freeze fish at sea and then thaw and fillet ashore to meet specific requirements. The goal is an end-product with all the physical characteristics of fresh fish in prime condition.

United Kingdom (Contd.):

The new thawing plant was designed to accommodate the 100-pound (42 by 21 by 4-inch) blocks of whole fish now being produced by certain freezer-trawlers. The

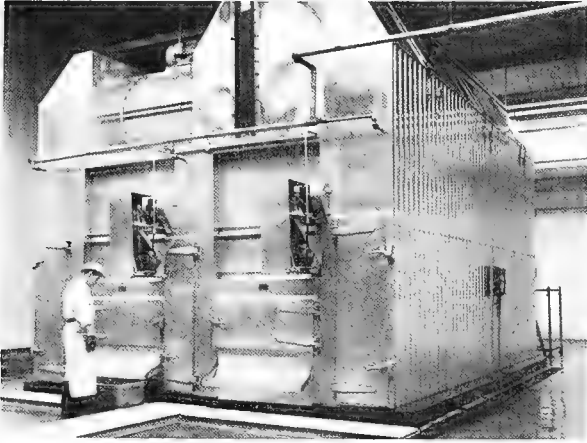


Fig. 1 - New frozen fish thawing unit operating in Grimsby.

thawing unit is, in effect, a large box (16 by 26 feet at the base), fitted at each end with entry doors and flap-sealed horizontal openings for the entry and removal of fish. It contains an insulated thawing chamber and the high velocity fans, heater units, and humidifiers of the thawing equipment. The thawing chamber is lined with zinc-sprayed, rust-proofed steel sheeting, and is equipped with twin five-tier noncorrosive endless rubber belts which carry the fish.

The whole fish blocks are fed on to the moving belts by roller conveyors. The fish

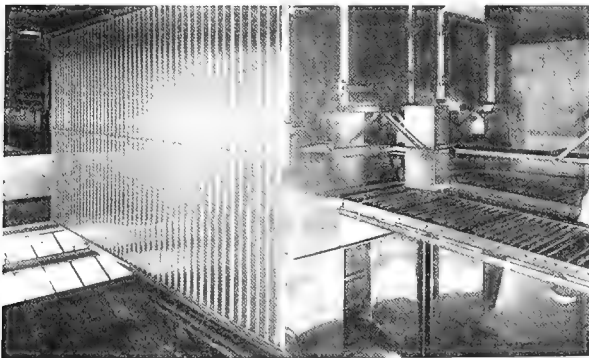


Fig. 2 - Shows the twin roller conveyors by which 100-pound frozen fish blocks enter the thawing chamber. Housed in the upper half of the structure are high velocity fans, and equipment regulating heat and humidity.

blocks are thawed in four hours by a combination of high velocity air, temperature, and humidity--all critically regulated, integrated, and timed. After thawing, the fish blocks emerge as individual fish ready for filleting. The unit can produce 1 to 1½ tons of thawed fish per hour.

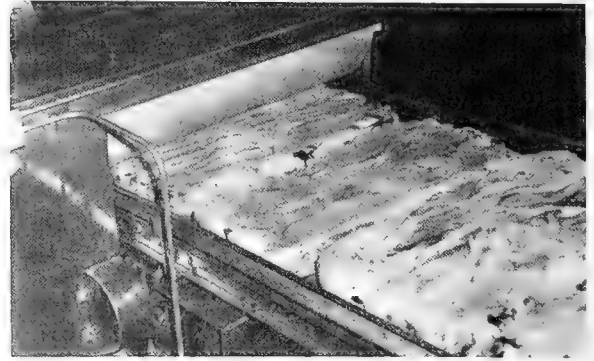


Fig. 3 - Frozen blocks of whole fish entering thawing unit.

The thawing unit's cycle speed of 4 hours represents a belt speed of 5 inches per minute. This can be varied to suit blocks of greater or lesser thickness than four inches.



Fig. 4 - After four hours of treatment by carefully regulated temperature, humidity, and high-velocity air, the fish blocks emerge from the thawing unit as individual fish ready for filleting.

It is claimed that the new thawing unit preserves the molecular structure of fish tissue, prevents scale damage, and preserves natural color.

The new thawing plant belongs to one of Britain's largest fishery firms. In using the hot-air method of thawing, it contains refinements not previously found in equipment of this type. At the same time, it reverses a

United Kingdom (Contd.):

trend towards dielectric thawing already in use in the British fishing industry.

* * * * *

**TRAWLER "STELLA LEONIS" WINS
SILVER COD TROPHY FOR 1963:**

The 1963 winner of the Silver Cod Trophy in Great Britain was the 190-foot trawler Stella Leonis which landed 39,556 kits (553,784 pounds) of fish valued at £161,500 (US\$452,200) in 1963. The vessel made 17 distant-water trips and was at sea for 335 days in 1963. The skipper of the Stella Leonis is only 33 years old, although he has 17 years of trawling experience.

The Silver Cod Trophy is presented annually to the British distant-water vessel with the largest catch for the year. In 1962, the winner of the trophy was the Somerset



Silver Cod Trophy winner in 1963. The Stella Leonis is fitted for starboard fishing only. Accommodations are provided amidships and aft for 30 persons. The fish-storage hold has a capacity of 18,170 cubic feet. The vessel is powered by a 1,800-horsepower Diesel engine.

Maugham with landings of 46,560 kits (6,518,400 pounds) valued at £146,182 (US\$409,130). The record for the competition, which started 10 years ago, is held by the Kirkella, which landed 46,589 kits or 6,522,460 pounds.

Note: See Commercial Fisheries Review, April 1963 p. 78.



SALT WATER CONVERSION BY MARINE WILDLIFE

How do sea mammals, sea birds, turtles, and marine iguanas which live on rocky ocean islands completely lacking in fresh water manage to thrive without this basic necessity? Many of the animals have special salt glands, which secrete a saline solution five times more concentrated than blood and twice as salty as sea water. Thus sea water is used and the excess salt eliminated via those glands. (Sea Secrets, April 1963.)

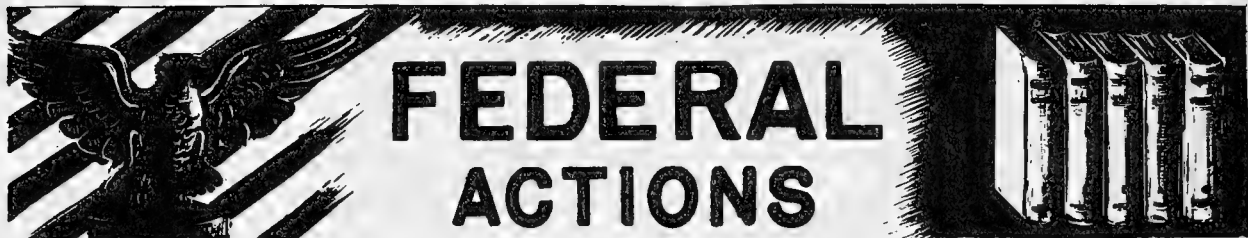
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Department of Commerce

SMALL BUSINESS ADMINISTRATION

ALASKA FIRM TO RECEIVE LOAN FUNDS FROM SBA INSTEAD OF ARA:

The Small Business Administration (SBA) approved a loan of \$155,000 to the Aleutian Development Company on November 20, 1963. The Area Redevelopment Administration (ARA) had previously, on June 13, 1963, approved an industrial loan of \$148,367 to the company to be used to replace and modernize its canning plant equipment and to permit expansion of salmon and crab canning operations at Jamal, Alaska. The ARA loan, however, was cancelled on December 27, 1963, following the approval of the loan to the Aleutian Development Company.



Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

NEW FEES FOR FISHERY PRODUCTS INSPECTION SERVICES:

New fees and charges for fishery products inspection services of the U. S. Department of the Interior became effective on February 15, 1964. The basic change was the increase in regular hourly rates for continuous inspection from \$4.45 to \$5.55 and for lot inspection from \$6.50 to \$7.80. The cost of maintaining the inspection service for processed fishery products and other products has increased since the adjustment of fees which became effective February 1, 1963.

The amendment as it appeared in the Federal Register of February 7, 1964, follows:

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER G—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

PART 260—INSPECTION AND CERTIFICATION

Changes in Fees and Charges

The regulations governing Part 260—Inspection and Certification of Subchapter G—Processed Fishery Products, Processed Products Thereof, and Certain Other Processed Food Products, relating to fees and charges (50 CFR 260.70 to 260.81) are hereby amended pursuant to the authority contained in section 6(a) of the Fish and Wildlife Act of 1956 (16 U.S.C. 724e(a)), as amended. The amendment as hereinafter set forth revises the schedule of fees and charges for inspection services.

As a result of the Federal pay increase effective January 1, 1964, and increased operating expenses, the cost of maintaining the inspection service for processed fishery products and other products has increased since the adjustment of fees which became effective February 1, 1963. The basic change is the increase in the hourly rates for continuous inspection from \$4.45 to \$5.55 and for lot inspection and related inspection services from \$6.50 to \$7.80.

The amendment is as follows:

1. Section 260.70 is hereby revised to read as follows:

§ 260.70 Schedule of fees.

(a) Unless otherwise provided in a written agreement between the applicant and the Secretary, the fees to be charged and collected for any inspection service performed under the regulations in this part at the request of the United States, or any agency or instrumentality thereof, shall be in accordance with the applicable provisions of §§ 260.70 to 260.81.

(b) Unless otherwise provided in the regulations in this part, the fees to be charged and collected for any inspection service performed under the regulations in this part shall be based on the applicable rates specified in this section for the type of service performed.

(1) Continuous inspection:

| | <i>Per hour</i> |
|-------------------|-----------------|
| Regular time..... | \$5.55 |
| Overtime..... | 6.00 |

Applicants shall be charged at an hourly rate of \$5.55 per hour for regular time and \$6.00 per hour for overtime in excess of 40 hours per week for services performed by inspectors assigned to plants operating under continuous in-

spection. Applicants shall be billed monthly at a minimum charge of 8 hours per working day plus overtime, when appropriate, for each inspector. A minimum yearly charge of 260 days will be made for each inspector permanently assigned to each plant.

(2) Lot inspection, officially and unofficially drawn samples.

For lot inspection services performed between the hours of 7 a.m. and 5 p.m. of any regular workday—\$7.80 per hour.

For lot inspection services performed between the hours of 5 p.m. and 7 a.m. of any regular workday—\$10.00 per hour.

For lot inspection services performed on Saturday, Sunday, and National legal holidays—\$10.00 per hour.

The minimum fee to be charged and collected for inspection of any lot of product shall be \$4.00.

(c) Fees to be charged and collected for lot inspection services furnished on an hourly basis shall be based on the actual time required to render such service including, but not limited to, the travel, sampling, and waiting time required of the inspector, or inspectors, in connection therewith, at the rate of \$7.80 per hour for each inspector, except as provided in paragraph (b) (2) of this section.

2. Section 260.71(c) is hereby revised to read as follows:

§ 260.71 Inspection services performed on a resident basis.

(c) A charge of \$7.80 per hour plus actual costs to the Bureau of Commercial Fisheries for per diem and travel costs incurred in rendering service not specifically covered in this section; such as, but not limited to, initial plant surveys.

3. Section 260.76 is hereby revised to read as follows:

§ 260.76 Charges based on hourly rate not otherwise provided for in this part.

When the appropriate Regional or Area Director determines that any inspection or related service rendered is such that charges based upon the foregoing sections are clearly inapplicable, charges may be based on the time consumed by the inspector in performance of such inspection service at the rate of \$7.80 per hour.

Notice of proposed rule making, public procedure thereon, and the postponement of the effective date of this revision later than February 15, 1964 (5 U.S.C. 1003), are impracticable, unnecessary

and contrary to the public interest in that: (1) the Agricultural Marketing Act of 1946, as amended, provides that the fees charged shall, as nearly as possible, cover the cost of the service rendered; (2) the increases set forth herein are necessary to more nearly cover such cost, including but not limited to, increased salaries to Federal employees required by recent legislation; (3) it is imperative that the increase in fees become effective in time to meet such increased costs; (4) users of the inspection service were notified that the rates of fees to be charged for inspection service would be reevaluated as to need for readjustment with each Federal pay act increase by inclusion of § 260.81 into Part 260 Inspection and Certification and published in the FEDERAL REGISTER (27 F.R. 4781); and (5) additional time is not required by users of the inspection service to comply with this revision.

(Sec. 205, 60 Stat. 1090, as amended; 7 U.S.C. 1622 and 1624)

Dated: February 4, 1964, to become effective at 12:01 a.m., February 15, 1964.

STEWART L. UDALL,
Secretary of the Interior.

FEBRUARY 4, 1964.

* * * * *

**NEWLY APPOINTED
FISHERY ATTACHE'S ARRIVE AT POSTS:**

Two fishery attachés, appointed by the U. S. Department of State in 1963, arrived in December at their respective posts, one in Latin America and the other in Africa. Richard S. Croker is now at the United States Embassy in Mexico City, Mexico, and will report on significant activities and developments in the Latin American region. George B. Gross, appointed to the post in Abidjan, Ivory Coast, will have regional responsibilities for fishery reporting on the countries along the western coast of Africa.



Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISIONS

**SHELLFISH-PROCESSING INDUSTRY
TO BE SURVEYED AGAIN:**

The shellfish-processing industry on the Atlantic and Gulf Coasts is to be surveyed again by the Wage and Hour and Public Contracts Division, U. S. Department of Labor, in order to determine the degree of compliance with the regulations of the Minimum Wage-Hour Law. The second survey is in connection with the expiration of the Handicapped Exemption Certificates as of April 1, 1964. After that date, only persons qualifying

by the regular standards of being handicapped will be exempted.

Because of the many problems created by the application of the Minimum Wage-Hour Law to persons shucking oysters in the Middle and South Atlantic States, the Wage and Hour and Public Contracts Division made a study in 1962 of the shellfish-processing industry. A survey conducted by the Department of Labor at that time included all plants processing clams, crabs, oysters, and shrimp on the Atlantic and Gulf Coasts during June 1962. The results of the study were published in December 1962 in the report "Shellfish Processing on the Atlantic and Gulf Coast."



Department of the Treasury

BUREAU OF CUSTOMS

**IMPORTS OF CANNED
"TUNA WITH VEGETABLES" DUTIABLE
AT 20 PERCENT AD VALOREM:**

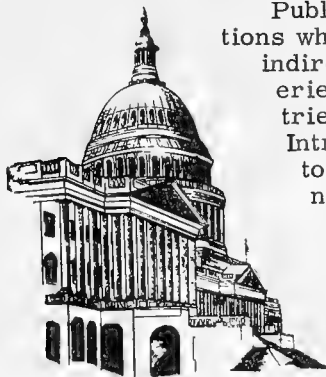
Canned tuna with vegetables--a product consisting of 43 percent tuna, 23 percent vegetables, and 34 percent highly seasoned sauce, with added rice bran oil--has been classified by the U. S. Bureau of Customs under the provision for "Edible preparations, not specially provided for . . . : Other" (dutiable at 20 per-

cent advalorem), item 182.91, Tariff Schedules of the United States. The decision was contained in a Bureau of Customs letter dated November 26, 1963. (Treasury Decisions, vol. 98, no. 50, December 12, 1963.)



Eighty-Eighth Congress

(Second Session)



Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

THE BUDGET OF THE UNITED STATES: H. Doc. 265, Part I, The Budget of The United States Government Fiscal Year Ending June 30, 1965 (House of Representatives, 88th Congress, 2nd Session), 475 pp., printed. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402, paper cover price \$1.50.) The budget as submitted Jan. 21, 1964, to the Congress, provides under funds for the Department of the Interior increases for the Fish and Wildlife Service. For the Office of the Commissioner \$393,000 as compared with \$386,000 in 1964. Estimates for the Bureau of Commercial Fisheries total \$26,445,000, an increase of \$2,467,766 over the amount for 1964: Management and Investigations of Resources \$20,681,000, an increase of \$2,856,766 over 1964 appropriations and includes \$1.8 million for expansion of oceanographic research; \$720,000 for botulism and pesticides studies; the Federal-State Columbia River Fishery Development Program, designed to offset losses to salmon and steelhead runs resulting from Federal projects in the Columbia River Basin, will be continued with \$588,000 requested for construction and \$2,260,000 for operation and maintenance of facilities; Construction of Fishery Facilities is \$4,200,000, which includes \$1,000,000 for a shellfish research center at Milford, Conn., and \$1,500,000 for a biological research laboratory for the tropical Atlantic area. Estimates for the Bureau of Sport Fisheries and Wildlife total \$47,396,000, a net increase of \$233,733 over 1964; Management and Investigations of Resources \$34,419,000, an increase of \$3,859,273; Construction \$3,593,000, a decrease of \$1,650,000.

COMMODITY PACKAGING AND LABELING: Packaging and Labeling Legislation (Hearings before the Subcommittee on Antitrust and Monopoly of the Com-

mittee on the Judiciary, United States Senate, 88th Congress, 1st Session), 979 pp., printed. Contains hearings held on S. 387, to amend the Clayton Act to prohibit restraints of trade carried into effect through the use of unfair and deceptive methods of packaging or labeling certain consumer commodities distributed in commerce, and for other purposes; Federal laws and regulations, State laws and regulations, wartime regulation of containers; and selected foreign jurisdictions.

H.R. 9940 (Roosevelt) introduced in House Feb. 7, 1964; referred to the Committee on the Judiciary; similar to S. 387.

CONSERVATION OF MARINE FISHERIES RESOURCES: The House Committee on Merchant Marine and Fisheries held hearings on Feb. 19 and 20, 1964, on S. 988, and related bills, to prohibit fishing in the territorial waters of the United States and in certain other areas by persons other than nationals or inhabitants of the United States.

H.R. 9957 (Rogers) introduced in House Feb. 8, 1964, and H.R. 10028 (Wilson) introduced in House Feb. 19, 1964; referred to the Committee on Merchant Marine and Fisheries; similar to S. 988.

CONSUMER PROTECTION: The American Consumer, Message from the President of the United States (H. Doc. 220), 7 pp., printed, received in the House and Senate February 5, 1964. Contains a statement of the consumer's position, recent advances, recommended legislation, administrative improvements, and conclusions. The President mentioned among other items the need to extend and clarify the inspection authority of the Food, Drug, and Cosmetic Act to permit inspection of factories where food is produced; the need for clarification of the law concerning the registration of pesticides; and the need to eliminate misleading advertising and packaging.

CUBAN FISHING ACTIVITIES IN UNITED STATES TERRITORIAL WATERS: Representative Rogers (Florida) on Feb. 3, 1964, addressed the House on the activities of the Cuban fishing fleet in United States territorial waters off Florida.

Representative Pelly (Washington) on Feb. 4, 1964, presented a statement to the House in support of the Senate-passed bill S. 988 (to prohibit fishing in the territorial waters of the United States and in certain other areas by persons other than nationals or inhabitants of the United States), which would prohibit the Cuban fishing fleet (or any other foreign fishing fleet) from entering United States territorial waters.

FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT: The House on Feb. 3, 1964, received the report (H. Rept. 1125) on H.R. 9739. The House on Feb. 17, 1964, passed S. 1605, amended (in lieu of H.R. 9739), to amend the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, to provide for labeling of economic poisons with registration numbers, to eliminate registration under protest, and for other purposes.

FISHERMEN'S FINANCIAL AID FOR ECONOMIC DISLOCATION: H.R. 9784 (Bennet) introduced in the House Jan. 28, 1964, to authorize the Secretary of the Interior to make payments to reestablish the purchasing power of American fishermen suffering temporary economic dislocation; referred to the Committee on Merchant Marine and Fisheries.

FISHERY RESOURCES: A magazine article titled "John F. Kennedy--Forthright for Fisheries" was inserted by Senator Magnuson in the Congressional Record, Appendix page A699, Feb. 17, 1964.

FOOD-FOR-PEACE, AND FISH: The Senate and House on Jan. 31, 1964, received a message from the President transmitting his legislative recommendations concerning agriculture (H.Doc.210). Among the items mentioned were Titles I and II of Public Law 480 concerning the food-for-peace program. The President recommended an extension of those two titles for five years. At the present time those titles would expire on December 31, 1964.

On Jan. 28, 1964, Senator Bartlett (Alaska) inserted in the Congressional Record, pages 1208-1209, an article which appeared in the Wall Street Journal concerning fish in the food-for-peace program.

Senator Bartlett inserted in the Congressional Record, page 2818, Feb. 17, 1964, a speech delivered at the annual convention of the National Cannery Association by the Director of the food-for-peace program describing the effect of the program and discussing the recent addition of certain fishery commodities to the program under Public Law 88-205.

MAINE FISHING INDUSTRY: On Jan. 31, 1964, Representative Tupper (Maine) inserted in the Congressional Record (Appendix, page A397) an editorial titled "Maine Fishing Industry Cannot Take Tariff Slash and Survive," from the Portland (Maine) Press Herald.

NORTH PACIFIC FUR SEALS CONVENTION: The Senate on Dec. 3, 1963, received a message from the President of the United States transmitting a protocol amending the interim convention on conservation of North Pacific fur seals, signed at Washington on Feb. 9, 1957, which protocol was signed at Washington on Oct. 8, 1963, on behalf of the Governments of Canada, Japan, the Union of the Soviet Socialist Republics and the United States of America (Ex. O, 88th Congress, 1st Session); referred to Committee on Foreign Relations.

The Senate Committee on Foreign Relations on Jan. 21, 1964, approved Protocol amending the interim convention on conservation of North Pacific fur seals. The Committee on Jan. 27, 1964, favorably reported (Ex. Rept. 1) Ex. O.

The Senate on Jan. 30, 1964, ratified Ex. O, Protocol amending the interim convention on conservation of North Pacific fur seals. No House action required.

OCEANOGRAPHY: Thirteenth Annual Report of the National Science Foundation, Message from the President of the United States (H. Doc. 209), 374 pp., printed, received in the House January 29, 1964. Contains a description of the program activities of the National Science Foundation including support of scientific research, institutional grants, education in the sciences, dissemination of scientific information, and studies of science resources. The Report includes a description of the Foundation's oceanographic programs which cover: (1) assistance for some of the most urgently required additions to the Nation's facilities for basic oceanographic research (this included 15 grants in 1963 totaling \$5.9 million for the construction or conversion of ships and the construction or expansion of shore facilities), and (2) coordination of the United

States program in the International Indian Ocean Expedition.

A statement by the Governor of California on oceanographic needs was inserted by Representative Hanna in the Congressional Record (Appendix pages 588-589), Feb. 7, 1964.

The article, "On the Shore of Narragansett Bay: a Great New Sea Laboratory," by the Dean of the Graduate School of Oceanography, University of Rhode Island, was inserted by Representative Fogarty in the Congressional Record (Appendix Pages A692-693), Feb. 13, 1964. The article describes the marine research facilities in the vicinity of Narragansett Bay and their relation to the New England fishing industry.

PRICE-QUALITY STABILIZATION: On Feb. 19, 1964, the Subcommittee on Quality Stabilization of the Senate Committee on Commerce concluded its hearings on S. 774, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes.

SCIENCE AND TECHNOLOGY OFFICE FOR CONGRESS: Establishment of a Congressional Science Advisory Staff (Hearing before the Subcommittee on Accounts of the Committee on House Administration, House of Representatives, 88th Congress, 1st Session), 88 pp., printed. Contains hearing held Dec. 4, 1963, on H.R. 6866 and H.R. 8066, to increase the effectiveness of the Congress in carrying out its functions by establishing a science advisory staff in the Senate and House of Representatives; includes testimony given by Members of Congress, officials of the Government, and members of various schools, associations, and in industry.

SMALL BUSINESS DISASTER LOANS: The House on Jan. 20, 1964, suspended the rules and passed, with amendments, S. 1309, to amend the Small Business Act by broadening the disaster loan authority and imposing criminal penalties for certain offenses. The bill, as amended by the House, contains three parts. (The bill as passed by the Senate contained four parts; the first part which would have involved an increased appropriation for the Small Business Administration revolving fund was deleted by a committee amendment in the House). The second part of the bill broadens the authority of the Small Business Act to make disaster loans to small business. At the present time this authority applies only to small businesses which have suffered economic injury because of draught or excessive rainfall. This would extend the authority to business injured by other natural disasters. The third part of the bill would extend the disaster loan authority to cases where economic injury was suffered by small businesses because of: "The inability * * * to process or market a product for human consumption because of disease or toxicity occurring in such product through natural or undetermined causes." The last part of the bill provides the Government with authority to bring criminal proceedings against anyone who steals property mortgaged or pledged to the Small Business Act for a loan.

The Senate on Jan. 27, 1964, concurred in the House amendments to S. 1309. The President on Feb. 5, 1964, signed S. 1309 into Public Law 88-264.

SOVIET FISHING INDUSTRY: The Postwar Expansion of Russia's Fishing Industry (Prepared at the Request of Hon. Warren G. Magnuson, Chairman, for the use of the Committee on Commerce, United States Senate by the Legislative Reference Service, the Library of Congress with Translations of fishery articles and news from Soviet publications by the Fisheries Research Institute, University of Washington), 59 pp., printed. Contains: (1) the growth of the Soviet annual fish catch; (2) the drive to the open sea; (3) expansion of the Soviet fishing fleet; (4) Soviet fishing tactics on the high seas; (5) the extracurricular activities of the fishing fleet; (6) fishery research and manpower training; (7) the economic status of the fishing industry; (8) the fisheries of Eastern Europe; (9) the outlook; a summary; and appendixes.

Representative Keith of Massachusetts on Jan. 31, 1964, inserted in the Congressional Record (Appendix, pages A409-A410) an article from the New Bedford (Mass.) Times titled "Red Fishing Threat."

CONSERVATION OF MARINE FISHERIES RESOURCES

A newspaper article on Soviet fishing activities on the high seas was inserted by Senator Magnuson in the Congressional Record, page 2800, Feb. 17, 1964.

TRANSPORTATION AMENDMENTS OF 1964: H.R. 9903 (Harris) introduced in House Feb. 5, 1964 (following hearings by the House Committee on Interstate and Foreign Commerce on some of the proposals originally contained in H.R. 4700 and H.R. 4701), to amend the Interstate Commerce Act and Federal Aviation Act of 1958 so as to strengthen and improve the national transportation system, and to implement more fully the national transportation policy, and for other purposes; referred to the Committee on Interstate and Foreign Commerce which favorably reported the bill to the House on February 6, 1964. The bill includes provisions which would extend to railroads and domestic water carriers the exemption now applicable to the transportation of agricultural commodities and fishery products by motor carriers. However, all carriers (of whatever mode) would be required to file with the Interstate Commerce Commission (ICC) their exempt rates on agricultural and fishery products, except those moving in trucks having three axles or less. The anti-trust laws would also be made applicable to the shipment of the exempt commodities.

The bill also contains provisions which among other things would: (a) permit shippers to recover damages from motor carriers and freight forwarders for unreasonable rates charged in the past (a right now limited to rail and water shipments); (b) permit persons injured by illegal operations to sue in Federal courts for injunctions, and permit the ICC to join shippers in en-

forcement proceedings; and (c) increase fines for certain violations of the Interstate Commerce Act to a maximum of \$500 for each offense and \$250 for each additional day of violation.

The bill would also amend section 1003 of the Federal Aviation Act of 1958 (49 U.S.C. 1483) which now provides for joint rates between air and other common carriers, and in the case of joint rates between air carriers and carriers subject to the Interstate Commerce Commission, for a joint board comprising representatives of both agencies to pass upon such joint rates in accordance with standards of the Federal Aviation Act. The bill would create a new joint board comprising representatives of the Civil Aeronautics Board, the Federal Maritime Commission, and the Interstate Commerce Commission to handle through service and joint rates between places in the United States and its possessions of any combination of air, water, and ground carriers where such rates are not subject to the individual regulatory jurisdiction of any one of those agencies.

Under this section, the Alaska Railroad would be authorized to establish through routes and joint rates with other carriers which would be under the jurisdiction of the joint board.

VESSEL CONSTRUCTION SUBSIDY AMENDMENTS: H.R. 9815 (Tupper) introduced in House Jan. 31, 1964, to amend the act of June 12, 1960, relating to the construction of fishing vessels to extend it for an additional period; referred to Committee on Merchant Marine and Fisheries.

Unlike S. 1006 and companion House bills on this subject pending before the Merchant Marine and Fisheries Committee, H.R. 9815 would merely extend the expired subsidy program (P. L. 86-516) for a total of 7 years (including the 3 years that the Program was in effect and the time that has elapsed since the Program expired) without increasing the amount of subsidy or deleting the restrictions in the old law. As under the old Program, H.R. 9815 would permit maximum subsidies of 33-1/3 percent and would limit the construction of subsidized vessels to fisheries injured by foreign imports. S. 1006 and the other bills pending before the House Committee would provide for subsidies of up to 55 percent and would eliminate restrictions regarding injury to a fishery from imports.

WATER POLLUTION CONTROL ADMINISTRATION: The House Committee on Public Works on Feb. 17-19, 1964, held and concluded hearings on H.R. 3166, 9963, 4571, S. 649, and H.R. 6844, and related bills, to amend the Federal Water Pollution Control Act, as amended. Testimony was given by public witnesses.





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

| Number | Title |
|----------|---|
| CFS-3340 | - Frozen Fishery Products, October 1963, 8 pp. |
| CFS-3344 | - Texas Landings, June 1963, 3 pp. |
| CFS-3345 | - Texas Landings, July 1963, 3 pp. |
| CFS-3346 | - Texas Landings, August 1963, 3 pp. |
| CFS-3352 | - Gulf Coast Shrimp Data, July 1963, 22 pp. |
| CFS-3357 | - New York Landings, September 1963, 4 pp. |
| CFS-3358 | - Gulf Coast Shrimp Data, 1962 Annual Summary, 38 pp. |
| CFS-3360 | - Massachusetts Landings, May 1963, 8 pp. |
| CFS-3361 | - North Carolina Landings, October 1963, 4 pp. |
| CFS-3362 | - California Landings, August 1963, 4 pp. |
| CFS-3363 | - Alabama Landings, September 1963, 4 pp. |
| CFS-3365 | - Georgia Landings, October 1963, 3 pp. |
| CFS-3366 | - South Carolina Landings, October 1963, 3 pp. |
| CFS-3367 | - Maine Landings, September 1963, 4 pp. |
| CFS-3368 | - Rhode Island Landings, September 1963, 4 pp. |
| CFS-3371 | - Florida Landings, October 1963, 8 pp. |
| CFS-3372 | - Louisiana Landings, September 1963, 3 pp. |
| CFS-3373 | - Gulf Fisheries, 1962 Annual Summary, 13 pp. |
| CFS-3374 | - Mississippi Landings, September 1963, 3 pp. |
| CFS-3375 | - New York Landings, October 1963, 4 pp. |
| CFS-3376 | - Fish Meal and Oil, October 1963, 2 pp. |
| CFS-3377 | - New Jersey Landings, September 1963, 4 pp. |
| CFS-3378 | - Wisconsin Landings, October 1963, 2 pp. |
| CFS-3379 | - Louisiana Landings, October 1963, 3 pp. |
| CFS-3380 | - North Carolina Landings, November 1963, 4 pp. |
| CFS-3382 | - Shrimp Landings, August 1963, 8 pp. |
| CFS-3389 | - Maine Landings, October 1963, 4 pp. |
| CFS-3390 | - Alabama Landings, October 1963, 4 pp. |

Sep. No. 700 - Utilization of U. S. Otter-Trawl Shrimp Vessels in the Gulf of Mexico, 1959-1961.

Report to the Bureau of Commercial Fisheries on the Branch of Economics, by James Crutchfield and others, Circular 173, 15 pp., April 1963. The primary

purpose of the Committee which prepared this report was to establish the appropriate structure and scale of economic effort in the operation of the Bureau of Commercial Fisheries. The report deals with relation of economic analysis to the operation of the Bureau; type of economic program that the Bureau should undertake; type of organization required to implement this program; and type of personnel required. An appendix covers statistical data requirements.

Report of the Bureau of Commercial Fisheries for the Calendar Year 1961, 86 pp., illus., printed 1963. During the calendar year 1961, the Bureau of Commercial Fisheries continued its efforts to provide the research and services that will assist the Nation to utilize fully and wisely its fishery resources. These efforts cover a wide spectrum of activities, from basic research in such fields as fishery biology or fish oil technology to such practical applications as demonstrations of fish cookery in schools or the dissemination of news of the daily prices for fish landed in principal United States ports. The report touches briefly on phases of biological, economic, engineering, oceanographic, and technological research. It also discusses the many Bureau service programs, such as those involved in fishery products inspection, fishery market promotion, market news reporting, statistics collection, vessel loans, vessel safety promotion, and others.

THE FOLLOWING MARKET NEWS LEAFLET IS AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, SUITE 611, WYATT BLDG., 777 14TH ST. NW., WASHINGTON, D. C. 20005.

| Number | Title |
|----------|--|
| MNL - 23 | - Fisheries of Chile, Part I--North Chile, 1960-1963, 52 pp. |

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LABORATORY, BOX 3830, HONOLULU, HAWAII, 96812.

Biochemical Studies on Fish Blood. V--On the Respiration Elements of Fish Blood, by Kaname Sato, illus., processed, limited distribution, October 1963. (Translated from the Japanese, Memoirs of the Kagoshima University Faculty of Fisheries, vol. 3, no. 1, September 1953, pp. 132-140.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE PUBLICATION IS AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LABORATORY, 2725 MONTLAKE BLVD., SEATTLE, WASH., 98102.

Bio-Statistical Material on Salmon Collected by the Soviet Section in 1960, 84 pp., processed. (Trans-

lated from the Russian, Sovetsko-Iaponskaia Kommissiia po Rybolovstvu v Severo-Zapadnoi Chasti Tikhogo Okeana (SIARK), Piataia Sessiia, Tokyo, 86 pp.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

- California Fishery Market News Monthly Summary, Part II - Fishing Information, December 1963, 8 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6317, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.
- (Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, November 1963, 14 pp. (Market News Service, U.S. Fish and Wildlife Service, U.S. Customs House, 610 S. Canal St., Rm. 1014, Chicago, Ill. 60607). Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.
- Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, November 1963, 8 pp. (Market News Service, U.S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130). Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.
- Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, December 1963, 4 pp. (Market News Service, U.S. Fish and Wildlife Service, 18 S. King St., Hampton, Va., 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.
- (Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, December 1963, 7 pp. (Market News Service, U.S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash., 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landing of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; Washington shrimp landings; and imports from other countries through Washington customs district; for the month indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ADDITIVES:

Carcinogenic Substances, Particularly 3,4-Benzpyrene, in Smoked Products and Measures to Eliminate Them, by L. M. Shabad, Working Paper No. 12, 12 pp., printed. (Translated from the Russian, Evaluation of the Carcinogenic Hazards of Food Additives, 1960). Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

ALGAE:

"Algenprodukte in der Pharmazie" (Algal Products in Pharmacy), by H. von Czetsch Lindenwald, article, Botanica Marina, vol. 3, no. 1, 1961, pp. 22-29, printed in German with English, French, and Spanish summaries. Studiengesellschaft zur Erforschung von Meeresalgen, e. V. Hamburg, Germany.

"The Blue-Green Algae," by M. V. Gusev, article, Microbiology, vol. 30, May-June 1962, pp. 897-911, printed. American Institute of Biological Sciences, 2000 P. St. NW., Washington 6, D. C.

"Chemical Composition of Some Philippine Algae," by Antonio I. de Leon, Natividad Eufemio, and Maxima Pineda, article, The Philippine Journal of Science, vol. 92, no. 1, March 1963, pp. 77-87, printed, single copy \$2. National Institute of Science and Technology, P. O. Box 774, Manila, Philippines.

"Cytochromes of a Blue-Green Alga: Extraction of a c-Type with a Strongly Negative Redox Potential," by Raymond W. Holton and Jack Myers, article, Science, vol. 142, no. 3589, October 11, 1963, pp. 234-235, printed, single copy 35 cents. American Society for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington 5, D. C.

"First All-Union Conference on the Cultivation of Unicellular Algae," by L. K. Osnitskaya and S. V. Goryunova, article, Microbiology, vol. 30, May-June 1962, pp. 918-921, printed. American Institute of Biological Sciences, 2000 P. St. NW., Washington 6, D. C.

"Protein Fat, Carbohydrate, and Ash Content of Some Mass Black Sea Planktonic Algae Grown in Cultures, U.S.S.R., by L. A. Lanskaya and T. I. Pshenina, OTs 63-31615, 17 pp., printed, 50 cents, August 26, 1963. Office of Technical Services, U.S. Department of Commerce, Washington, D. C., 20235.

ANCHOVY:

"Un Analisis del Numero de Vertebrae de la Anchoveta Peruana (Engraulis ringens J.)" (An Analysis of the Number of Vertebrae of the Peruvian Anchovy, Engraulis ringens J.), by R. Jordan, article, Boletín, vol. 1, no. 2, 1963, pp. 25-43, illus., printed in Spanish with English summary. Library, Instituto de Investigación de los Recursos Marinos, P. O. Box 3734, Lima, Peru.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Descripción de Huevos y Larvas de Anchoveta Peruana (Engraulis ringens J.)" (Description of Eggs and Larvae of the Peruvian Anchovy, Engraulis ringens J.), by H. Einarsson and B. Rojas de Mendiola, article, Boletín, vol. 1, no. 1, 1963, pp. 1-23, illus., printed in Spanish with English prologue and summary. Library, Instituto de Investigación de los Recursos Marinos, P.O. Box 3734, Lima, Peru.

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of recommendations and actions. Describes briefly the activities of each of the member States during that period. Includes short discussions of U. S. Fish and Wildlife Service activities in shellfish, bottomfish, and pelagic fish exploration; offshore shrimp gear research; faunal assessment; shrimp burrowing behavior studies; experiments in electrical stimulation of pink shrimp; and a physiology and behavior of young shrimp program. Also discusses the estuarine ecology program, industrial fishery program, a fishery-oceanographic research vessel under construction, pesticides program, oyster program, clam studies, red tide program, voluntary standards of grade for fishery products, the Inspection Service, market development programs, and investigation of navigation projects. Also contains the financial report of the Commission for the year ended June 30, 1963.

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"Freeze-Dried Assets," article, The Farm Index, vol. II, no. 12, December 1963, pp. 9-10, printed, single copy 20 cents. Economic Research Service, U.S. Department of Agriculture, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) The freeze-dry industry, which now packs annually only \$2 to \$5 million worth of food, will be packing almost a quarter of a billion dollars worth by 1970. A recent study showed that the added cost of freeze-drying over freezing makes these foods now unable to compete with frozen foods. Many freeze-dried products don't compare favorably with frozen or canned foods. Some foods cannot be successfully freeze-dried either because the cost is too high for the low quality of the fresh product or because of the loss in flavor and appearance. Good prospects for freeze-drying include shrimp and other shellfish. Freeze-drying equipment is expensive, costing a minimum of \$300,000 for a full-size commercial plant. By 1967 processing costs should level off at about 4-5 cents per pound of water removed and the drying cycle should decrease to 6-8 hours.

Freeze-Dried Foods: Palatability Tests, by Kermit Bird, Marketing Research Report No. 617, 38 pp., illus., processed, July 1963. Marketing Economics Division, Economic Research Service, U.S. Department of Agriculture, Washington, D.C., 20250. Most freeze-dried foods on the market are "acceptable" from a palatability standpoint as judged by a taste panel in the U.S. Department of Agriculture during the course of this study. None of the 28 freeze-dried foods evaluated received an "unacceptable" score as to palatability, and two-thirds of them were as good as the processed foods with which they were compared. Palatability is rated in terms of general acceptance and the 5 quality characteristics are appearance, flavor, juiciness, texture, and tenderness. The freeze-dried items taste-tested included beef, pork, chicken, fishery products, soups, and several mix-

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tures of foods. When compared with their frozen or canned counterparts, 3 of them, including shrimp creole, were considered superior; 15, including shellfish, were about the same; and 10 were rated poorer. Freeze-dried foods used in prepared mixtures received higher scores, on the average, than the same foods served plain. On the basis of these ratings, freeze-dried foods appear to have some prospects for volume production. Their chief market, however, may be in competition with conventionally-dried foods. Similar to these, freeze-dried products are lightweight, have long shelf life, and can be stored without refrigeration. In addition, they are said to retain more of their original physical structure, flavor, and nutritive value than air- or heat-dried products. There are some processed foods for which freeze-drying will replace the present processing method, according to the author.

Freeze-Drying of Foodstuffs, edited by S. Cotson and D. B. Smith, 295 pp., illus., printed, 50s. (about US\$7), 1963. Columbine Press, Old Colony House, South King St., Manchester 2, England. Based on a Symposium at the Borough Polytechnic, London, October 1961. Presents information on the freeze-drying process, products of the process, commercial plants and equipment, packaging and packaging machinery, and marketing and future prospects of the industry.

"Principios Generales de la Liofilizacion Alimentaria" (General Principles of Freeze-Drying of Foods), by Louis Rey, article, Revista del Frio, vol. VIII, no. 1, January-March 1963, pp. 11-26, illus., printed in Spanish with English abstract. Centro Experimental del Frio, Serrano, 150, Madrid, Spain.

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Conference, welcoming address, review of First Governors' Salmon Conference, and objectives of Second Conference. It also covers committee reports and recommendations, Conference recommendations, closing remarks and summary, and actions taken pursuant to Conference recommendations. Appendices include reports made to committees on research on regulations to provide maximum sustained yield, research on maintenance and improvement of natural production, research on supplements and substitutes for natural reproduction, economic utilization, and coordination of research.

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"Tariff Board Inquiry on Prawns," article, *Fisheries Newsletter*, vol. 22, no. 11, November 1963, pp. 17-18, 20, printed. Commonwealth Fisheries Office, Department of Primary Industry, Canberra, Australia. Tariff Board held a public hearing in Brisbane on September 13 and one in Canberra on October 3, 1963, in the course of its inquiry into whether assistance should be given to the production of "shrimps, prawns, shrimp meat and prawn meat, preserved by cold process;" if so, the nature and extent of such assistance; and, if the Board found for assistance by tariff, what rates of duty should be provided. Testimony was given by several witnesses. After the inquiry was closed, the Board reported its findings to the Minister for Trade.

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Guide to Civil Defense Management in the Food Industry, Agricultural Handbook No. 254, 34 pp., illus., printed, November 1963. Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C., 20250. The history of mankind and the records of wars clearly demonstrate that food is a prime weapon, target, and element of survival. It should be obvious, therefore, that there is a pressing need in the food industry for careful planning and continuing cooperation with local, State and Federal governments in preparing a national survival program. This handbook discusses in detail orientation to civil defense planning in the food industry, civil defense preparations, industry-Government cooperation for community survival, and operations during the survival period.

Travel, Entertainment, and Gift Expenses, Internal Revenue Service Publication No. 463, 18 pp., printed, 15 cents, 1963. Internal Revenue Service, U. S. Department of Treasury, Washington, D. C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C., 20402.) A booklet containing detailed information on the new rules enacted by Congress for deducting business travel, entertainment, and gift expenses. The booklet also explains the recordkeeping substantiation requirements. Numerous examples are given to illustrate how the rules operate and the specific kinds of information which should be recorded and maintained in various circumstances. A chart which shows at a glance the factors to be proved in substantiating elements of an expenditure is of special interest.

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"Taxonomic and Ecological Studies of the Genus *Hypomesus* of Japan," by Keikichi Hamada, article, *Memiors of the Faculty of Fisheries*, vol. 9, no. 1, 1961, pp. 1-55, printed. The Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

SMOKING:

Smokehouses and the Smoke Curing of Fish, compiled by Iola I. Berg, 47 pp., illus., processed. Washington

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

State Department of Fisheries, 115 General Administration Bldg., Olympia, Wash. Discusses in detail, with accompanying diagrams, smoke-curing principles, smokehouses, methods of hanging fish for smoking, hot smoking, and cold smoking. Also includes information on smoking method for sportsmen, construction of the controlled smokehouse, smoking processes, portable smoker and barbecue grill, and recipes for preparing smoked fish dishes.

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"Effects of Tylosin and Nisin on Canned Food Spoilage Bacteria," by C. B. Denny, L.E. Sharpe, and C. W. Bohler, article, Applied Microbiology, vol. 9, no. 2, 1961, pp. 108-110, printed. Williams and Wilkins Co., 428 E. Preston St., Baltimore 2, Md.

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Statistical Services of the United States Government, 143 pp., printed, \$1, revised edition 1963. Office of Statistical Standards, Bureau of the Budget, Executive Office of the President, Washington, D. C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C., 20402.) Part I describes the statistical system of the Federal Government. In a section on organization it describes the procedures followed to achieve coordination within a decentralized statistical system, and distinguishes between the various types of statistical agencies. Part II presents brief descriptions of the principal economic and social statistical series collected by Government agencies. For each of about 50 subjects it tells what agencies are concerned and what kinds of data are collected and made available. Part III contains a brief statement of the statistical responsibilities of each agency and a list of its principal statistical publications.

STERN TRAWLERS:

"Stern Trawlers," article, Canadian Fisherman, vol. 49, no. 5, 1962, pp. 19-34, illus., printed. National Business Publications Ltd., Gardenvale, Que., Canada.

STRIPED BASS:

"Effect of Ocean Temperature on the Seaward Movements of Striped Bass, Roccus saxatilis, on the Pacific Coast," by John Radovich, article, California Fish and Game, vol. 49, no. 3, 1963, pp. 191-206, printed. California Department of Fish and Game, 722 Capital Ave., Sacramento 14, Calif.

TAGGING:

"Estimates of Mortality Rates from Tag Recoveries," by G. J. Paulik, article, Biometrics, vol. 19, no. 1, 1963, pp. 28-57, printed. Department of Statistics, Virginia Polytechnic Institute, Blacksburg, Va.

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Taiwan Fisheries Yearbook, 1963 Edition, 212 pp., illus., printed in Chinese and English; August 1963. Taiwan Fisheries Bureau, Department of Agriculture and Forestry, Provincial Government of Taiwan,

Taipei, Taiwan. Contains statistical tables on fishermen's organizations and membership, number of fishing vessels, status of ice-making and cold-storage industries, fisheries production in quantity and value, and quantity of supply and sale of fishery products and their average value at principal fish markets. Also includes data on processed marine products, fish culture area, production of fish fries, number of casualties of fishermen, losses and damages to fishing craft, and marine products trade. Most data are for 1962.

TENNESSEE VALLEY AUTHORITY:

Tributary Area Development in the Tennessee Valley, 16 pp., illus., printed, 1963. Tennessee Valley Authority, Knoxville, Tenn.

TRADE LISTS:

The U. S. Department of Commerce has published the following trade list. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of Trade Promotion, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., 20230, or from Department of Commerce field offices at \$1 each.

Canneries and Frozen Foods--Producers and Exporters--Thailand, 8 pp., August 1963. Lists the names and addresses, size of firms, and types of products (including fish and shrimp) handled by each firm.

TRAWLING:

"Les Engins de Peche--Le Chalutage, les Operations de Peche" (Fishing Gear--Trawling, Fishing Operations), by A. Percier, article, France Peche, no. 78, November 1963, pp. 55-56, 58, illus., printed in French single copy 2.5 F (about 50 U.S. cents). France Peche, Boite Postale 179, Lorient, France.

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"Effect of Hatchery Rearing Conditions on Stream Survival of Brown Trout," by Alfred W. Eipper, article, Transactions of the American Fisheries Society, vol. 92, no. 2, 1963, pp. 132-139, printed. Secretary, American Fisheries Society, P.O. Box 483, McLean, Va.

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THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

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"Dynamical Relationships between Variations of the Antarctic Fin Whale Catch and Catcher's Day's Work," by Takeyuki Doi, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, December 1962, pp. 1168-1172, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku Tokyo, Japan.

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"Distribution and Movement of Marked Walleyes in Oneida Lake, New York," by John L. Forney, article, Transactions of the American Fisheries Society, vol. 92, no.1, 1963, pp. 47-52, printed. Secretary, American Fisheries Society, P.O. Box 483, McLean, Va.

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EMPLOYMENT OUTLOOK FOR OCEANOGRAPHERS

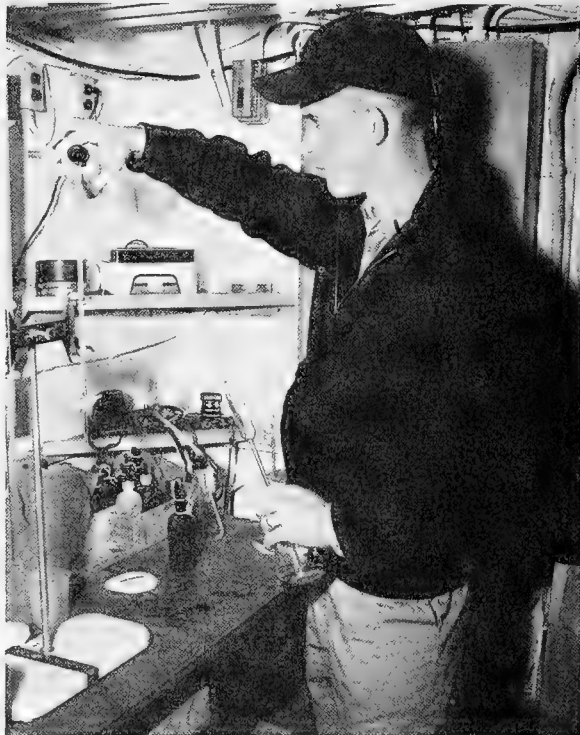
In recent years, the growing realization of the importance of the oceans to the Nation's welfare and security has heightened interest in oceanography and has opened new fields for specialists in the science.

The ocean, which covers more than two-thirds of the earth's surface, supplies food and minerals, influences the climate, provides a medium of transportation, and offers means of recreation. Oceanographers are the scientists who study the ocean in all its aspects--its characteristics, movements, and plants and animals. The results of their studies not only extend basic scientific knowledge, but also contribute to the development of practical methods for use in such operations as charting and forecasting currents, ice conditions, and ocean waves; improving fisheries; and providing defense against enemy attack.

Oceanographers are usually specialists in one of the four main branches of the profession. Biological oceanographers (marine biologists) study the ocean's plant and animal life, which ranges from microscopic plankton to giant squid and whales. Physical oceanographers study the physical aspects of the ocean, such as its density, temperature, and ability to transmit light and sound; and the movement of the sea, such as waves, tides, and currents; and the relationship between the sea and the atmosphere. Geological oceanographers (marine geologists) study the ocean bottom--its topographic features and the rocks and sediments found there. Chemical oceanographers investigate the chemical composition of the ocean waters and bottom, which include at least traces of more than half of the total number of known physical elements.

Employment opportunities for oceanographers are expected to be excellent throughout the 1960's, particularly for those with advanced degrees. Well-trained persons with bachelor's degrees in related sciences and with some formal training in oceanography should also have favorable opportunities, primarily as research assistants and in routine analytical positions.

The outlook is for rapid growth of the small profession, both during the 1960 decade and over the long run.



Oceanographer conducts sea water oxygen analysis aboard ship.

--A reprint from the Occupational Outlook Quarterly,
May 1963 (Vol. 7, No. 2)

U. S. Department of Labor, Bureau of Labor Statistics.

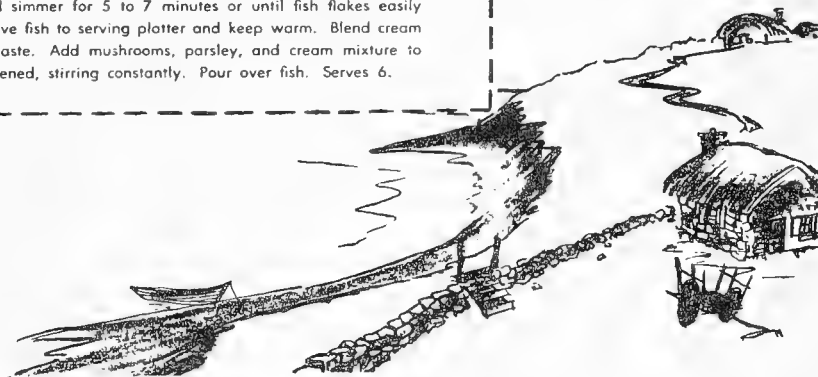
SHANNON SALMON STEAKS



Shannon Salmon Steaks simmered in cider until succulent and topped with a colorful mushroom sauce; here is real eating. Salmon steaks, fresh from cold North Pacific waters, have become a favorite throughout the country. This new recipe, delightful in its simplicity, yet outstanding in its appeal, will aptly awaken average appetites.

- | | |
|--|--|
| 2 pounds salmon steaks or other fish steaks, fresh or frozen | 1/2 cup coffee cream |
| 2 tablespoons butter or margarine | 1 tablespoon flour |
| 1/2 cup cider or apple juice | 1 can (4 ounces) sliced mushrooms, drained |
| 1 teaspoon salt | 2 tablespoons chopped parsley |

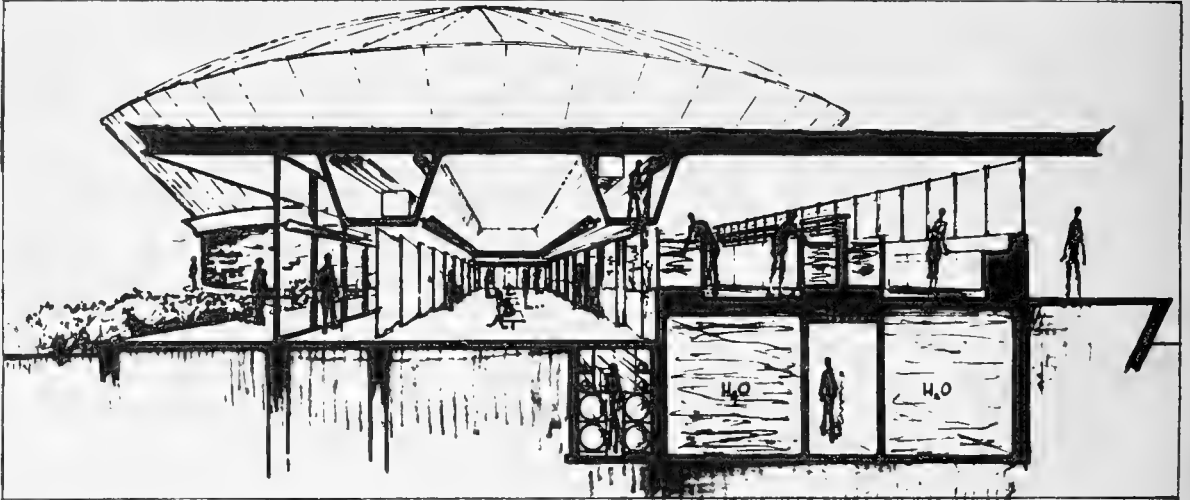
Thaw frozen steaks. Melt butter in a large frying pan. Place fish in pan; add cider and salt. Cover pan and simmer for 5 to 7 minutes or until fish flakes easily when tested with a fork. Remove fish to serving platter and keep warm. Blend cream and flour to make a smooth paste. Add mushrooms, parsley, and cream mixture to liquid in pan. Cook until thickened, stirring constantly. Pour over fish. Serves 6.



--From Fisheries Marketing Bulletin: "Protein Treasure from the Seven Seas." Issued by the National Marketing Services Office, U. S. Bureau of Commercial Fisheries, Chicago 5, Ill.

A PREVIEW OF THE NATIONAL FISHERIES CENTER AND AQUARIUM

The National Fisheries Center and Aquarium, authorized by Congress in late 1962, will house a unique population of aquatic animals. A vast variety of creatures from waters around the globe will be available at the Center in Washington, D. C., for scientific research, for education, and for entertainment.



An artist's concept of the National Fisheries Center and Aquarium.

The new Center is expected to be completed by about 1967. It will be a great attraction for scientists and visitors from all over the world. It will be the focus for all aquariums in the country, and will provide leadership in the study of aquatic animals for all scientific purposes. By disseminating information about aquatic life, the Center will help people understand the importance of marine conservation.

When completed, the Center will house about 1,300 different kinds of aquatic animals from all over the world. A great variety of other land and water inhabitants besides fish also will be included in the collection.

The Center's permanent scientific staff will work with research professors, graduate students, and outstanding fishery workers from foreign countries. Their projects will include research in genetics; reproduction; nutrition studies; fish diseases; experimental ecology; behavior of aquatic organisms; antibiotics produced by marine animals; and other pressing fishery problems, many related to human biology and medicine.

The great diversity of fresh-water and marine fishes, mammals, and other aquatic forms will permit the study of species not usually available. The study of these animals can be important to research in human and animal diseases. In some respects fish are superior to warm-blooded animals for experiments. The metabolic rate can be controlled in fish by controlling the temperature of the water.

Research at the Center will provide information about fish for human consumption.

The new field of marine pharmacology may help develop new biologicals of value in treating human illness, as well as diseases of some of our important fresh water and marine fishes.

At the Center visitors will see educational exhibits on fish and fishery products and research that they can find nowhere else. The animals will be displayed in pools, tanks, and other facilities which meet their living requirements, to give the public an opportunity to study aquatic community life. The vast range of aquatic habitat will be illustrated in the accurate replicas of a fresh-water living stream progressing from a mountain lake through various levels until it reaches the sea, the ocean with its range from a coral reef to dark abyss. In addition, a tropical section will exhibit a wide variety of fish, both fresh water and marine.

Material covering the entire range of fisheries and aquarium work will be available at the Center. These will include studies of fishery and aquatic life, illustrated catalogs of aquariums, specimen brochures, and films, and photographic materials which explain the work and objectives of the National Fisheries Center and of the research to be undertaken.

COMMERCIAL FISHERIES REVIEW

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Fishes



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Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

G. A. Albano and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, Wyatt Bldg., Suite 611, 777 14th Street, NW., Washington, D. C. 20005.

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 1, 1963.

5/31/68

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COVER: The M/V Kaho, exploratory fishing and gear research vessel operated on the Great Lakes by the U. S. Bureau of Commercial Fisheries. She is 65 feet long with an 18-foot beam, is powered by twin 150 hp. Diesel engines, and has a cruising speed of 12 knots. Her home port is Saugatuck, Mich. The name of the vessel derives from the Chippewa Indian word for "hunt."

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COMMERCIAL FISHERIES REVIEW

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LAKE ERIE FISHERIES EXPLORATIONS, MAY-NOVEMBER 1960

By Ira A. Carr*

BACKGROUND

Exploratory fishing in the Great Lakes was started in the fall of 1958 by the U. S. Bureau of Commercial Fisheries. A sharp decline in availability of choice food fish and increased abundance of lower-priced, less-preferred species had forced many commercial fishermen out of business while others continued to operate at marginal or unprofitable levels. The immediate objective of the Bureau was to determine the most efficient methods for taking smelt (*Osmerus mordax*). Smelt were known to be abundant, but they could not be taken profitably by trap nets or pound nets, except during relatively short seasonal periods when excessive production caused market gluts.

In the 1958 explorations, small trap-net vessels were chartered for lampara-seine explorations. A larger trap-net boat was chartered and rigged for trawling and lampara-seine operations in 1959, and exploratory cruises were conducted from April through November (Sand and Gordon 1960). The trawl proved to be effective in taking commercial quantities of smelt in Lake Erie over extended periods and areas. The 1959 study also defined trawlable areas, seasonal depth distribution, and temperature preference of smelt, and provided valuable data on the relative availability of other species to the trawl. Limited seining was not successful.

Trawling explorations were continued in 1960 to define further the availability of smelt by season, depth, and area. The 1959 findings were substantiated and knowledge concerning the distribution and periods of availability of smelt were extended.

AREA OF OPERATION

Lake Erie, fourth largest of the five Great Lakes, has a surface area of 9,940 square miles. It is the shallowest of the lakes; the mean depth is 63.9 feet (Wright 1955). The northern part of Lake Erie lies in Canada, and the southern part lies in the United States (fig. 1).

Ontario borders the entire north shore of the lake and Michigan, Ohio, Pennsylvania, and New York share the west, south, and east shores. The lake may be divided into three distinct, yet broadly connected basins. The shallow western basin (maximum depth 48 feet) lies west of a line connecting Point Pelee on the north shore and Sandusky, Ohio, on the south shore. Much of that area is unsuitable for trawling because of outcroppings of bedrock, the many islands and shallow reefs, submerged net stakes, and an extensive commercial trap-net fishery. The large central basin (maximum depth 84 feet) covers almost two-thirds of the lake and was generally clear of obstacles to trawling in the areas fished. That basin is bordered on the east by a rock and sand bar that extends from the base of Long Point (north shore) to Erie, Pa. (south shore). The eastern basin is the deepest portion of the lake (maximum depth 210 feet). The bottom in most of this area is suited for trawling except for inshore depths less than about 8 fathoms ($\frac{1}{2}$ to $2\frac{1}{2}$ miles from shore).

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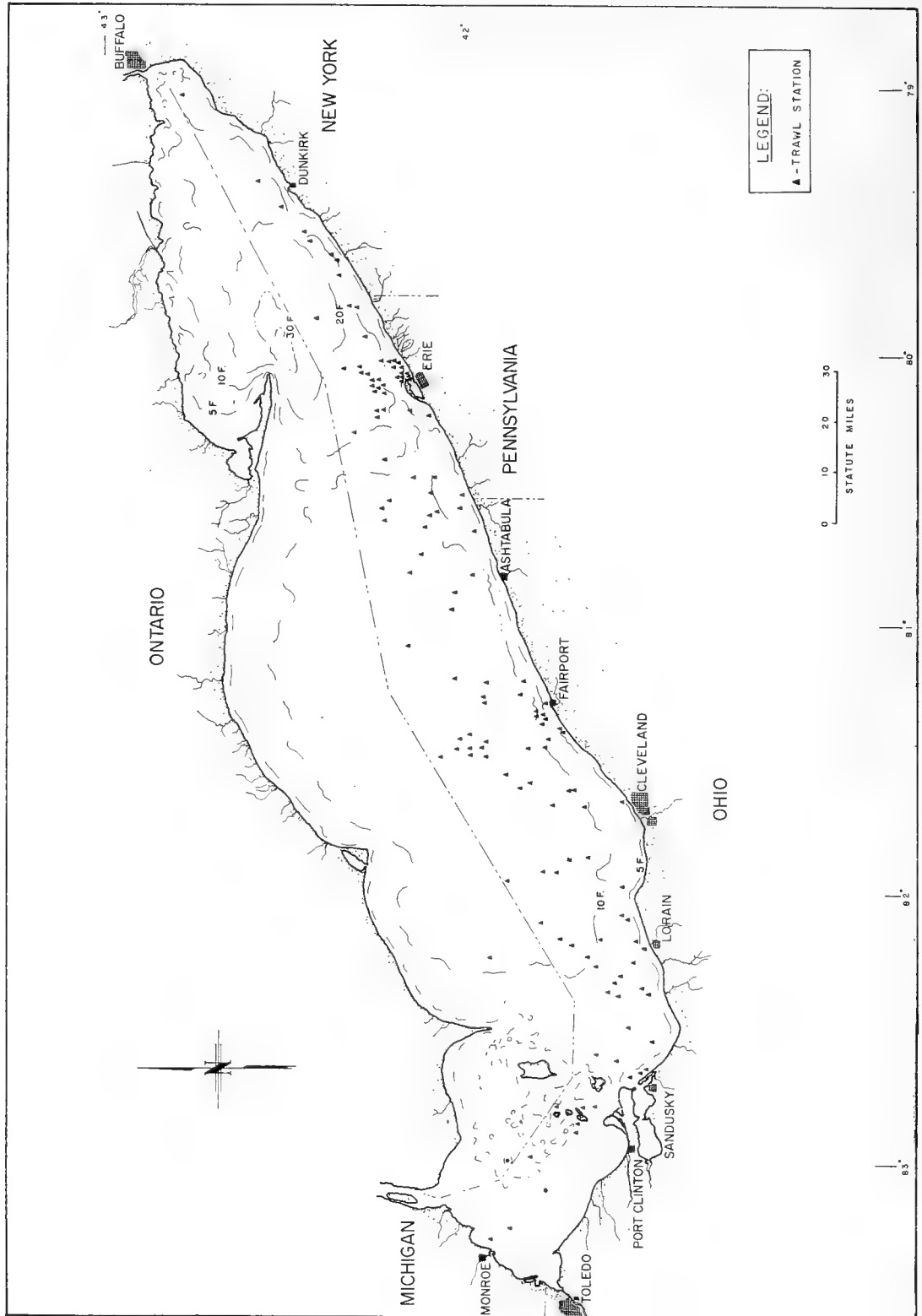


Fig. 1 - Exploratory trawling stations, Lake Erie, April-November 1960.

VESSEL, GEAR, AND METHODS

A large converted trap-net vessel, the M/V Active (fig. 2), first chartered and rigged for trawling in 1959, was purchased in 1960. This vessel was of wood construction, 50 feet long with a $14\frac{1}{2}$ -foot beam, and a draft of $4\frac{1}{2}$ feet. After limited explorations in the spring, the vessel was repowered with a 147-hp. (continuous duty) Diesel engine with a 3:1 reduction gear, and a new deckhouse-pilothouse was added. Accessory equipment included a shallow-water echo-sounder with sufficient range and power to permit fish detection and bottom sounding at all depths. Continuous recordings were made while either cruising or fishing to locate and define bottom obstacles and evaluate the density and depth distribution of fish.

A standard 50-foot (headrope length) Gulf of Mexico 2-seam semi-balloon trawl was used for all but 5 drags. This trawl was made of $2\frac{1}{2}$ -inch, 18-thread cotton mesh in the wings and body and $1\frac{1}{2}$ -inch mesh in the intermediate section and cod end. The remaining 5 drags were made with a net of similar design, but with 4-inch mesh in wings and body. The bracket-type otter boards measured $2\frac{1}{2}$ by 5 feet and weighed 200 pounds each. All drags were made with Pacific Coast-type dandyline gear with 60-foot bridles. The gear was set off the stern and the cod end was retrieved by a lazyline before the catch was hoisted aboard. Gear damage for the season was slight; only one trawl was torn beyond repair.



Fig. 2 - Exploratory fishing vessel Active after addition of a new deckhouse-pilothouse in 1960.

Most drags were 30 minutes long and held as closely as possible to a constant depth. Dragging speed averaged approximately $2\frac{1}{2}$ miles per hour. Observations including the catch, weather, sea conditions, bottom conditions, and water temperature were recorded at each station. Surface temperatures were recorded with an electric temperature meter and surface-to-bottom temperature profiles with a bathythermograph. Fish were separated and weighed by species, and numbers of smelt per pound were determined.

FISHING RESULTS

Lake Erie's three basins provide different environments which greatly influence not only the composition of fish stocks, but also their seasonal distribution. Although fishing was scattered and limited in some areas (no fishing in some months), the results were sufficient to provide general information on local differences and seasonal changes in distribution, abundance, and availability of smelt to bottom trawls.

Catches during the 1959-60 explorations (see Sand and Gordon 1960 for 1959 data) show that smelt prefer cool water. Those in the western end of the lake move eastward into the deeper central and eastern basins as summer advances. The results also give strong evidence that smelt, although not heavily concentrated at any particular depth during May and June in the central basin, are present in sufficient quantity for commercial production. As the water warms, smelt prefer depths greater than 55 feet in the central basin and occasionally become heavily concentrated within a very narrow depth range. In late October, they again scatter, and by November were still available to trawls in commercial quantities but were not concentrated at any particular depth.

The seasonal bathymetric distribution of smelt in the eastern basin is essentially the same as that described for the central basin except that a deeper habitat is available and the smelt continue to move into deeper water during late summer and early fall. The extent of interchange of smelt between the central and eastern basins is not known. An easterly movement would be suspected during periods of oxygen depletion in the central basin,¹ but this point cannot be substantiated. It is apparent that water temperature is the principal factor in the distribution of smelt, but other factors such as food, oxygen, and spawning behavior influence distribution, especially when the temperature is not critical. The effects of currents and seiches may also be important.

The results of the 1960 work are discussed by basin. Tables 2-5, which summarize the fishing results by month, species, depth, and basin, follow the discussion. Two drags in a total of 129 were not used in the computations because of gear damage which undoubtedly affected the catches. Common names of fish are used throughout; the scientific names are listed in table 1.

WESTERN BASIN: Exploratory trawling totaled 19 drags in the western basin in May, June, August, and October. The smelt were scattered in May-June, but available in moderate quantities at nearly all depths (15-47 feet) fished (table 2). Smelt made up 86.4 percent of the catches which averaged 207 pounds an hour, and yellow perch accounted for the remaining 13.6 percent. Limited trawling in that basin in August and October caught few or no smelt and produced light catches of yellow perch, sheepshead, carp, and emerald shiners (tables 3 and 4). White bass, goldfish, gizzard shad, spottail shiners, channel catfish, alewives, trout-perch, and stonecats were each taken in amounts of less than 5 pounds per drag.

| Common Name | Scientific Name |
|---|-------------------------------------|
| Alewife | <i>Alosa pseudoharengus</i> |
| American smelt | <i>Osmerus mordax</i> |
| Blue pike | <i>Stizostedion vitreum glaucum</i> |
| Burbot | <i>Lota lota</i> |
| Carp | <i>Cyprinus carpio</i> |
| Channel catfish | <i>Ictalurus lacustris</i> |
| Emerald shiner | <i>Notropis atherinoides</i> |
| Gizzard shad | <i>Dorosoma cepedianum</i> |
| Goldfish | <i>Carassius auratus</i> |
| Lake herring | <i>Coregonus artedii</i> |
| Sheepshead (fresh-water drum) | <i>Aplodinotus grunniens</i> |
| Spottail shiner | <i>Notropis hudsonius</i> |
| Stonecat | <i>Noturus flavus</i> |
| Trout-perch | <i>Percopsis omiscomaycus</i> |
| Yellow pike (walleye) | <i>Stizostedion v. vitreum</i> |
| White bass | <i>Roccus chrysops</i> |
| White crappie | <i>Pomoxis annularis</i> |
| White sucker | <i>Catostomus commersoni</i> |
| Whitefish | <i>Coregonus clupeaformis</i> |
| Yellow perch | <i>Perca flavescens</i> |

Table 2 - Summary of 1960 Lake Erie Exploratory Trawl Catches During May 18-June 15

| Basin | Depth (Feet) | Number of Drags | Catch Rate (Pounds Per Hour) | | Species Composition | |
|---------|--------------|-----------------|------------------------------|---------|---|-----------------------------|
| | | | Range | Average | Species | Percentage of Catch |
| Western | 15-20 | 1 | - | 200 | Smelt Other species | 100.0 1/Tr. |
| | 25-47 | 8 | 30-340 | 207 | Yellow perch (over 8") Yellow perch (4" to 8") Smelt Other species | 9.8 5.4 84.7 Tr. |
| Central | 18-24 | 1 | - | 1,480 | Yellow perch (over 8") Yellow perch (4" to 8") Smelt Other species | 5.4 67.6 27.0 Tr. |
| | 25-49 | 5 | 24-520 | 172 | Yellow perch (over 8") Yellow perch (4" to 8") Smelt Other species | 20.8 16.2 64.0 Tr. |
| | 50-64 | 7 | 36-760 | 331 | Yellow perch (over 8") Yellow perch (4" to 8") Smelt Other species | 19.6 11.5 68.9 Tr. |
| Eastern | 55 | 1 | - | 116 | Smelt Other species | 100.0 Tr. |
| | 75 | 1 | - | 2/ | Smelt | 100.0 |

1/Tr., less than 0.05 percent.

2/Less than 5 pounds an hour.

¹/State of Ohio and Bureau biologists reported vast areas of oxygen depletion near the bottom in the western and central basins during September of 1960 (Carr 1962).

CENTRAL BASIN: Exploratory trawling included a total of 64 drags during May, June, August, September, October, and November. Commercial quantities of smelt were available at various depths in that area during much of the period (tables 2-5). Exceptions were in early September and late November. In early September, extensive sounding transects and limited fishing revealed a lack of fish throughout the area. In 1959, however, excellent catches (up to 4,800 pounds an hour) were taken off Conneaut, Ohio, at 60-79 feet in September and

Table 3 - Summary of 1960 Lake Erie Exploratory Trawl Catches During August 3-September 15

| Basin | Depth (Feet) | Number of Drags | Catch Rate (Pounds Per Hour) | | Species Composition | |
|---------|--------------|-----------------|------------------------------|---------|-------------------------|---------------------|
| | | | Range | Average | Species | Percentage of Catch |
| Western | 25-44 | 2 | 90-106 | 98 | Yellow perch (4" to 8") | 43.9 |
| | | | | | Yellow perch (under 4") | 5.1 |
| | | | | | Sheepshead | 28.6 |
| | | | | | Other species | 22.4 |
| Central | 50-74 | 11 | 90-504 | 255 | Yellow perch (over 8") | 2.4 |
| | | | | | Yellow perch (4" to 8") | 11.7 |
| | | | | | Smelt | 85.0 |
| | | | | | Other species | 0.9 |
| | 75-76 | 5 | 172-848 | 555 | Yellow perch (over 8") | 2.1 |
| | | | | | Yellow perch (4" to 8") | 6.1 |
| | | | | | Smelt | 90.1 |
| | | | | | Other species | 1.7 |
| Eastern | 15-24 | 1 | 2/ | 2/ | Smelt | 100.0 |
| | 50-74 | 11 | 0-160 | 42 | Yellow perch (over 8") | 8.3 |
| | | | | | Yellow perch (4" to 8") | 13.9 |
| | | | | | Smelt | 65.6 |
| | | | | | Burbot | 12.2 |
| | | | | | Other species | 1/Tr. |
| | 76-80 | 4 | 80-2,450 | 1,310 | Yellow perch (over 8") | 0.5 |
| | | | | | Smelt | 98.5 |
| | | | | | Burbot | 1.0 |
| | | | | | Other species | Tr. |

1/Tr., less than 0.05 percent.

2/Less than 5 pounds an hour.

Table 4 - Summary of 1960 Lake Erie Exploratory Trawl Catches During October 4-16

| Basin | Depth (Feet) | Number of Drags | Catch Rate (Pounds Per Hour) | | Species Composition | |
|---------|--------------|-----------------|------------------------------|---------|-------------------------|---------------------|
| | | | Range | Average | Species | Percentage of Catch |
| Western | 15-24 | 2 | 2/1-62 | 31 | Carp | 100.0 |
| | | | | | Other species | 1/Tr. |
| | 25-49 | 6 | 2/1-64 | 20 | Emerald shiners | 95.0 |
| | | | | | Carp | 5.0 |
| | | | | | Other species | Tr. |
| Central | 44-49 | 1 | - | 122 | Carp | 100.0 |
| | | | | | Other species | Tr. |
| | 50-75 | 14 | 2/1-1,350 | 364 | Yellow perch (4" to 8") | 0.6 |
| | | | | | Smelt | 97.8 |
| | | | | | Other species | 1.6 |
| Eastern | 43-49 | 1 | - | 3/ | Yellow perch (over 8") | 50.0 |
| | | | | | White bass | 50.0 |
| | 50-74 | 4 | 2/1-8 | 2 | Burbot | 100.0 |
| | | | | | Other species | Tr. |
| | 75-99 | 8 | 82-940 | 474 | Yellow perch | 0.2 |
| | | | | | Smelt | 99.6 |
| | | | | | White suckers | 0.2 |
| | | | | | Other species | Tr. |
| | 127 | 1 | - | 380 | Smelt | 100.0 |

1/Tr., less than 0.05 percent.

2/Lower limit of range was less than 5 pounds an hour.

3/Less than 5 pounds an hour.

early October during commercial-type fishing. In early October 1960, smelt were heavily concentrated within a narrow depth range (72-75 feet). The average catch rate for 6 drags at those depths was 890 pounds an hour. Few or no smelt were taken at lesser depths. In late November, smelt apparently were scattered and catches were smaller (up to 330 pounds per hour). Best catches of smelt by month in 1960 from that basin were as follows: May 375-400 pounds an hour at 52-53 feet; June 400 pounds an hour at 18-22 feet and 180-240 pounds an

hour at 58-64 feet; August 400-848 pounds and hour at 65-76 feet; October 244-840 pounds an hour at 72-73 feet and 1,260-1,320 pounds an hour at 74-75 feet; November 214-330 pounds an hour at 40-45 feet.

Good catches of yellow perch were taken occasionally in the central basin. The proportion of salable-size perch (over 8 inches) varied from 8 to 80 percent. This percentage could be raised considerably by the use of larger cod-end mesh. Best average catches by month were at the following depths: May 250-360 pounds an hour at 52-53 feet; June 1,080 pounds an hour at 18-22 feet; August 140 pounds an hour at 50 feet; September 180 pounds an hour at 60 feet.

The following species were each taken from that basin in amounts of 5 pounds or less per drag: white bass, burbot, emerald shiners, spottail shiners, lake herring, whitefish, trout-perch, sheepshead, alewives, gizzard shad, and white crappie.

EASTERN BASIN: Forty-four drags were completed in that basin--only 2 before August. Catches in August were small at all depths fished (15-64 feet). In early September, however, the largest smelt catch (2,450 pounds per hour) of the 1960 fishing was taken at 78 feet off Erie, Pa. This concentration of smelt was narrowly distributed and could not be located when the area was revisited several days later. Catches were light, up to 180 pounds per hour, at lesser depths in September. Good smelt catches (up to 900 pounds a hour) were made at 60-75 feet, and catches of up to 1,500 pounds an hour were taken at greater depths (82-85 feet) in September of 1959 (Sand and Gordon 1960).



Fig. 3 - A good catch of smelt taken off Erie, Pa., in September 1960 by the M/V Active.

Catches of smelt were again good in October 1960 at depths greater than 72 feet: 364 pounds an hour at 73-78 feet; 340-360 pounds an hour at 82-90 feet; 640-940 pounds an hour at 90-98 feet; 380 pounds an hour at 127 feet. Fair coverage of depths from 25 to 98 feet in November produced smelt catches ranging from only a few pounds to 136 pounds per hour. At no time during 1960 did fishing in the eastern basin yield commercial quantities of smelt at depths shallower than 60 feet. Yellow perch were not taken in commercial quantities in the eastern basin.

Table 5 - Summary of 1960 Lake Erie Exploratory Trawl Catches During November 7-22

| Basin | Depth (Feet) | Number of Drags | Catch Rate (Pounds Per Hour) | | Species Composition | |
|---------|--------------|-----------------|------------------------------|---------|--|----------------------------|
| | | | Range | Average | Species | Percentage of Catch |
| Central | 6-24 | 3 | 54-138 | 108 | Smelt Burbot Other species | 92.9 5.5 1.6 |
| | 25-49 | 7 | 6-330 | 140 | Smelt Burbot Gizzard shad Other species | 96.1 1.2 2.0 0.7 |
| | 50-74 | 10 | 2/1-210 | 62 | Smelt Carp Alewife Other species | 81.6 10.7 6.1 1.6 |
| Eastern | 25-49 | 6 | 2/1-136 | 23 | Smelt Other species | 100.0 1/Tr. |
| | 50-74 | 4 | 12-122 | 64 | Smelt Other species | 100.0 Tr. |
| | 75-98 | 2 | 2/1-20 | 10 | Smelt Other species | 100.0 Tr. |

1/Tr., less than 0.05 percent.
2/Lower limit if range was less than 5 pounds an hour.

Other species that collectively amounted to only 1.2 percent of the total catch were alewives, blue pike, stonecat, gizzard shad, trout-perch, white bass, emerald shiners, burbot, lake herring, yellow pike, and white suckers.

Table 6 - Summarization of 1959-60 Lake Erie Smelt Trawling Explorations by Cruise for M/V Active

| Date | Basin | Fishing Depth (Fathoms) | Number of Drags | Average Time Per Drag (Minutes) | Catch Rate (Pounds Per Hour) | |
|------------------|-------------------------------|-------------------------|-----------------|---------------------------------|------------------------------|---------|
| | | | | | Range | Average |
| 1959 | | | | | | |
| April 21-May 13 | Western | 2-6 | 14 | 25 | 0-50 | 15 |
| June 2-24 | Central | 2-13 | 45 | 30 | 0-600 | 195 |
| July 6-23 | Central | 6-13 | 66 | 45 | 0-500 | 137 |
| August 3-17 | Central Eastern | 5-25 | 31 | 34 | 0-500 | 97 |
| Aug. 27-Sept. 6 | Central Eastern | 5-25 | 29 | 34 | 0-1,200 | 250 |
| Sept. 22-Oct. 8 | Central | 9-13 | 39 | 60 | 0-4,800 | 1/1,462 |
| October 20-27 | Central | 5-13 | 14 | 29 | 0-60 | 15 |
| November 9-23 | Western | 2-12 | 16 | 33 | 0-20 | 6 |
| 1960 | | | | | | |
| May 18-28 | Western Central | 2-10 | 16 | 28 | 0-400 | 202 |
| June 6-16 | Western Central Eastern | 3-13 | 10 | 27 | 0-400 | 145 |
| August 3-19 | Western Central Eastern | 2.5-12.5 | 21 | 31 | 0-790 | 244 |
| Aug. 30-Sept. 23 | Central Eastern | 8-13 | 14 | 23 | 0-2,450 | 401 |
| October 4-19 | Western Central Eastern | 2.5-16.5 | 37 | 28 | 0-1,320 | 247 |
| November 7-22 | Central | 1-17 | 32 | 32 | 0-260 | 70 |

1/This high average resulted from high-volume commercial-type fishing on heavily concentrated smelt. All other average catches are the result of random exploratory fishing assessments and are not a true indication of potential commercial production rates.

CONCLUSION

The 1960 explorations substantiated the 1959 findings that smelt can be taken on a commercial scale with trawls in the central and eastern basins of Lake Erie throughout most of the fishing season (table 6), and extended knowledge concerning seasonal distribution and availability to trawls of smelt and other species. Temperature plays an important role in the seasonal distribution of smelt. At times, smelt were concentrated within a very narrow depth range; consequently, it is recommended that commercial vessels be equipped with good electronic fish-finders for this method of fishing. Data indicate that when smelt are concentrated in commercial quantities, other species are scarce; thus sorting offers no problem.

APPENDIX

A detailed fishing log, showing geographic position, depth, date, catch, and related data for each drag is available as an appendix to the reprint of this article. Write for Separate No. 702, which includes "Table 7 - Fishing Log, Trawl Stations, 1960, M/V Active, Lake Erie."

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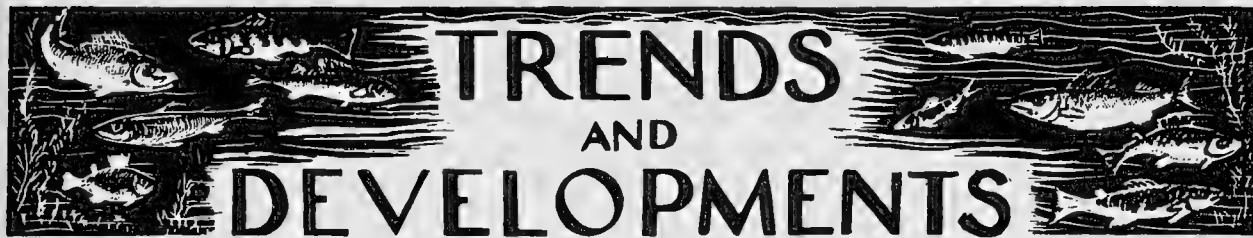
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|--|--|



COD CROSSES THE ATLANTIC

Scientists at the Lowestoft Fisheries Laboratory have reported a remarkable migration by a cod. The fish was tagged in the North Sea in June 1957 and was recaptured by a Polish factory trawler on the north-eastern slope of the Grand Bank, Newfoundland, in December 1961. During its 4½ years of freedom it had grown from 22½ to 29½ inches.

Although it is generally accepted that cod are capable of crossing deep-water barriers between fishing banks, this is probably the first record of a complete crossing of the North Atlantic by this species. (Scottish Fisheries Bulletin No. 20, December 1963.)



TRENDS AND DEVELOPMENTS

Alaska

PINK SALMON WORKSHOP MEETS IN JUNEAU:

A one-week Pink Salmon Workshop was held at Juneau, Alaska, this past January. More than 75 management and research biologists attended the workshop meetings to discuss the present status and future needs of pink salmon research on the west coast of North America. Agencies represented were the Alaska Department of Fish and Game, Canadian Department of Fisheries, Washington Department of Fisheries, Fisheries Research Board of Canada (Nanaimo), Fisheries Research Institute, and the Bureau's Auke Lake and Montlake Laboratories.

Prediction of the magnitude of pink salmon runs was emphatically stressed by management biologists as their most important research requirement with the need to determine optimum escapement levels a close second. Research biologists reported on progress in the problems of migrations, optimum spawning escapement, and discovery of mortality factors in stream, estuary, and ocean environments. The status of natural and artificial spawning channel studies was also discussed. The smoltlike development of pink fry in the estuary and coastal marine waters was an interesting concept discussed by Nanaimo and Auke Bay biologists, suggesting further avenues of study towards solving problems of pink salmon growth and abundance. It was concurred that a breakthrough is imminent in estuarine research.

FOREIGN FISHING ACTIVITY IN BERING SEA:

The Soviet fleets fishing in the eastern Bering Sea continued to build up during January, but Japanese fishing activities remained at a low level.

More than 150 Soviet trawlers and associated support vessels were believed to be fishing in the Bering Sea. Major emphasis was reported to be on herring and, to a lesser degree, flatfish and rockfish.

The Japanese shrimp factoryship Chichibu Maru and her accompanying trawlers returned to Japan in late December 1963. In January two stern trawlers of the Akebono Maru type were reported fishing in the eastern Bering Sea within the Area 3B North Triangle regulatory zone.

ALASKA FISHERY LANDINGS, 1963:

Dungeness crab and king crab landings were at a record level in 1963 in Alaska. However, 1963 landings of all other important fishery products were down from 1962, according to preliminary statistics.

| Alaska Commercial Fishery Landings, 1/1963 with Comparisons | | | |
|---|---------------------|---------|-----------------------------|
| Species | 1/1963 | 1962 | Percentage Change From 1962 |
| | .. (1,000 Lbs.) ... | | |
| Sablefish | 1,100 | 1,400 | -21 |
| Salmon: | | | |
| King | 8,000 | 8,700 | -9 |
| Chum | 33,000 | 57,700 | -43 |
| Pink | 120,000 | 143,300 | -16 |
| Red | 34,000 | 52,900 | -36 |
| Coho | 13,000 | 15,200 | -14 |
| Total | 208,000 | 277,800 | -25 |
| Herring | 31,000 | 33,900 | -9 |
| Clams | 400 | 700 | -43 |
| Crabs: | | | |
| Dungeness | 11,800 | 9,000 | +31 |
| King | 77,000 | 52,800 | +46 |
| Shrimp | 14,400 | 16,900 | -15 |
| 1/Preliminary. | | | |

BAIT HERRING FISHING AT KETCHIKAN:

The annual harvest of bait herring at Ketchikan was under way during January, with deliveries made to three cold-storage plants. Those landings were principally from Ward Cove, a traditional herring fishing ground near Ketchikan. By the end of January three vessels had landed more than 1.5 million pounds of herring. Fishing was expected to continue through February to provide bait for king crab and halibut fishermen during the 1964 fishing season.

HERRING GROWTH AND MORTALITY RATES ANALYZED:

Analyses of the past 30 years of herring statistics show that apparently mortality rates are much lower for fish that are 8 years old and over than for younger fish. Also, herring caught from the outside waters of Southeast Alaska weigh less during the early years of maturity than do fish taken from the inner waters. Frequency distributions of sizes for different age groups show a persistent bimodality for both inner and outer herring strongly suggesting different groups or stocks within each population. Tests of the data from thousands of samples are under way to determine the extent and significance of the differences in mortality and weights.



California

SHRIMP RESOURCES OFF CALIFORNIA COAST SURVEYED:

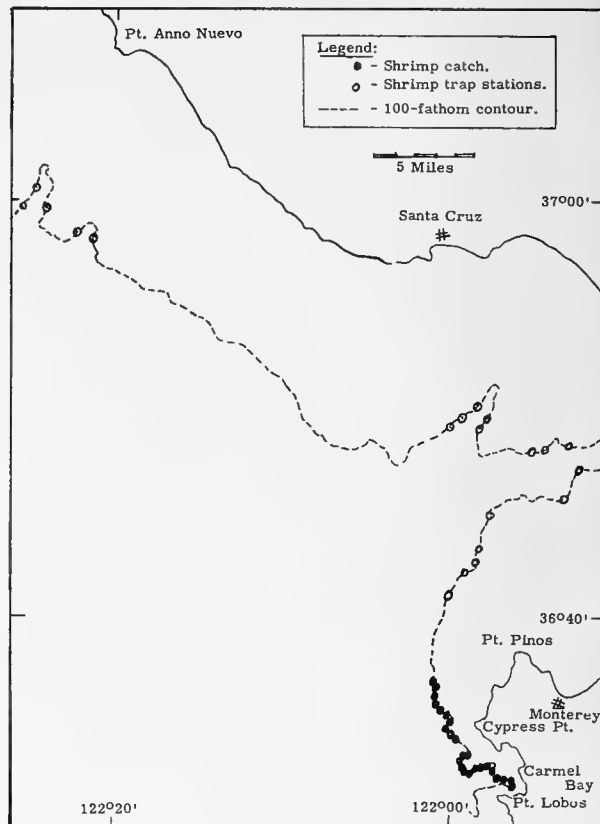
M/V "Alaska" Cruise 64-A-1-Prawn (January 8-30, 1964): The objectives of this cruise by the California Department of Fish and Game research vessel Alaska off the California coast between Pt. Anno Nuevo and Purissima Point were to: (1) conduct exploratory fishing for spotted shrimp (Pandalus platyceros), (2) determine size, sex, and weight of shrimp from different areas, and (3) make bathythermograph casts to obtain bottom temperatures at trap stations.

A total of 75 shrimp trap sets were made from Pt. Anno Nuevo to Anacapa Island (45 sets were with cylindrical traps and 30 with rectangular traps). A set consisted of 6 to 8 traps attached by 1-fathom gangions at 10-fathom intervals along the mainline. Nearly all sets were at right angles to contours of submarine canyons in depths of 70 to 115 fathoms.

Traps were paid out in a straight line as the vessel moved from deep to shallow soundings over the canyon slope. After the last trap was shot, 120 fathoms of free line was laid out toward shore. One hundred pounds of anchor chain was then attached to the line and marked with a buoy.

The cylindrical traps used were 42 inches long and 22 inches in diameter, and rectangular traps 15 by 15 by 30 inches. All were made of $\frac{3}{8}$ -inch reinforced steel rod covered with $1\frac{1}{2}$ -

inch nylon mesh. Mesh entrance tunnels were tapered to $3\frac{1}{4}$ inches. Each trap had an entrance tunnel extending from each end toward the center, about one-third the length of the trap.



Shows part of Cruise 64-A-1 of the M/V Alaska (Jan. 8-30, 1964).

The only areas producing shrimp in appreciable numbers were off Cypress Pt. and Carmel Bay. In all, a total of 2,533 shrimp weighing 317 pounds were caught. Highest catch rates were 2.8 pounds-per-trap for a set of 8 cylindrical traps, and 2.6 pounds-per-trap for a set of 7 rectangular traps.

Average shrimp catches in rectangular and cylindrical traps were:

| Average Shrimp Catches during Cruise 64-A-1 | | | |
|---|----------------------------|---------------------|------------------------------------|
| Type of Trap | Pounds .. (Per Trap) .. | Number of Shrimp | Heads-on Shrimp Count Per Pound |
| Rectangular | 1.3 | 9.3 | 7.2 |
| Cylindrical | 1.8 | 14.9 | 8.3 |
| Total | 1.6 | 13.2 | 8.2 |

The heads-on count of shrimp caught ranged from 6.3 to 13.2 per pound. Mean carapace lengths for males, transitionals, and females

were 37.7, 42.0, and 47.5 millimeters (about 1.5, 1.7, 2.1 inches), respectively. Of those, 25 percent were males, 12 percent transitionals and 63 percent females. More than 98 percent of the females were carrying eggs.

Five trap sets made along the canyons near Pt. Año Nuevo yielded negligible catches as did 15 sets made in Monterey Canyon between Pt. Pinnos and Santa Cruz.

From Pt. Sur to Lopez Pt., 15 sets were made with little success. One trap near Partington Pt. yielded 2 pounds but the area as a whole was unproductive. Ten sets made from Pt. Piedras Blancas to Purissima Pt. yielded only 3 shrimp.

At Anacapa Island only the deepest of 5 trap sets caught shrimp just 2.5 pounds.

Only one bathythermograph cast was made during the cruise because of a winch breakdown. The cast was made off Pt. Lobos and the temperature was 8.9° C. (48° F.) at 120 fathoms. Surface temperature was 12.1° C. (53.8° F.).

Incidental fish catches were light, mostly sablefish (*Anoplopoma fimbria*) and filamented sculpins (*Icelinus filamentosus*). Other fish included juvenile rockfishes, cuskeels, brotulids, flatfish, and hagfish. Invertebrates consisted mostly of octopi, hermit crabs, nudibranchs, starfish, sea urchins, and crabs.

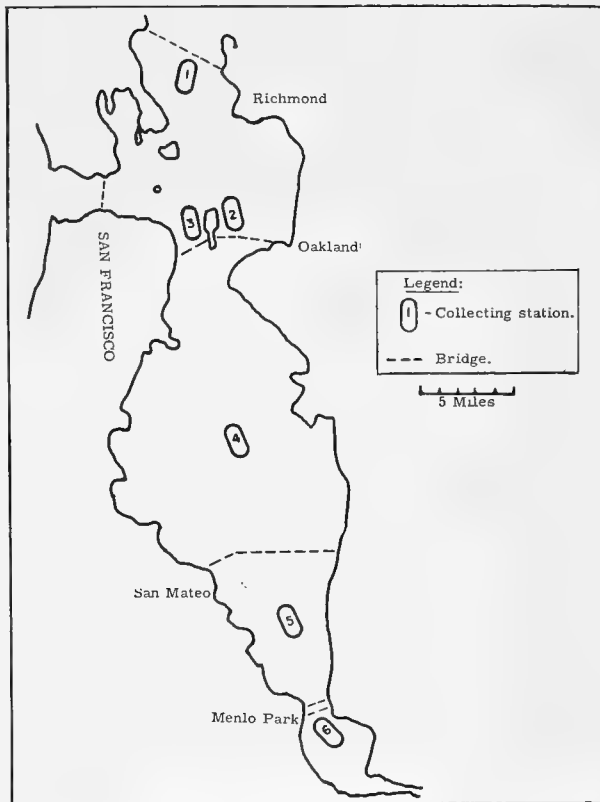
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SAN FRANCISCO BAY INVESTIGATIONS CONTINUED:

M/V "Nautilus" Cruise 63-N3i-k S. F. Bay Study (Fourth Quarter 1963): The monthly study of San Francisco Bay south of San Pablo Bay by the California Department of Fish and Game research vessel Nautilus was continued during the fourth quarter of 1963. Short cruises were made during October, November, and December to: (1) collect fish and invertebrates routinely at six stations to determine distribution and relative abundance under prevailing environmental conditions, (2) define ecological zones of the bay, and (3) determine the food of the principal fish and its availability.

At each station, a square-mouthed mid-water trawl 25 feet on a side was towed for 20 minutes or more at the surface. Each of the 6 stations was also sampled by a 15- to 20-minute bottom tow with a beam-trawl net

10 feet wide and 4 feet high with 1-inch mesh. To avoid overloading the net with dead shells or mud, two 10-minute tows were made on the soft bottoms encountered at Stations 1, 4, 5, and 6.



Shows collecting stations during San Francisco Bay study by M/V Nautilus.

Two species of fish were added to the bay collection list with the capture of 4 turbot (*Pleuronichthys coenosus*) at Station 4, and a dwarf perch (*Micrometus minimus*) at Station 1. A total of 54 species of fish were taken in 1963 during the monthly sampling of San Francisco Bay which began in February. Plans call for the study to be continued through 1964. A series of samples through several seasons will be required to determine relative abundance of species from year to year.

October and November 1963 water temperatures were within the range 11.9° to 15.6° C. (53.4° to 60.1° F.) recorded on previous cruises. However, the December 1963 mean temperature of 9.4° C. (48.9° F.) was below the lowest monthly mean recorded for other months in 1963. In the deeper water, the bottom temperature was as high or higher than the surface temperature.

Salinities were between the 13.9‰ to 34.1‰ limits measured earlier in 1963.

Note: See Commercial Fisheries Review, Dec. 1963 p. 20, and Sept. 1963 p. 15.

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GROWTH AND LIFE HISTORY OF KING SALMON INVESTIGATED:

M/V "Nautilus" Cruise 63-N-2g, 2h, 2i, and 2j-Salmon (August 10-12, September 10, November 4-11, December 8-9, 1963): To collect juvenile king salmon (Oncorhynchus tshawytscha) for scale-development analysis and obtain data on their life history in the study area were the objectives of this series of cruises by the California Department of Fish and Game research vessel Nautilus. The areas of operations were in San Francisco Bay and in the Gulf of Farallones.

A total of 98 tows using a midwater trawl having a 25-foot square opening with a $\frac{1}{2}$ -inch mesh cod end was completed in San Francisco Bay and the Gulf of Farallones. All were 20-minute surface tows made during daylight hours. A total of twelve unmarked king salmon was taken. Those varied from 7.0 to 15.8 centimeters (2.8 to 6.2 inches) fork-length.

A total of 71 tows was made in San Francisco Bay during all phases of tide, and both with and against tidal current. Eleven king salmon were caught varying from 9.2 to 15.8 centimeters (3.6 to 6.2 inches) fork-length. Most salmon were taken in or around tide rips. But difficulty in keeping the net set in those areas made it impossible to fish them most of the time. Other species taken in the Bay were anchovy, jacksmelt, American shad, surfsmelt, herring, dogfish, soupfin shark, brown rockfish, and threadfin shad.

Twenty-seven tows were made in the Gulf of Farallones. One king salmon 7.0 centimeters (2.8 inches) fork-length was caught. Other species taken in the Gulf were herring, jacksmelt, tomcod, and sand lance.

* * * * *

PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 64-1-Pelagic Fish (January 20-23, 1964): To determine the inshore distribution and abundance of pelagic fish schools, the inshore area from Point Anno Nuevo to the United States-Mexican Border was surveyed from the air by the Cali-

fornia Department of Fish and Game's Cessna "182" 9042T.

On January 20, the area from Point Vicente to the United States-Mexico Border was scouted, but scouting conditions were poor between Point Vicente and Dana Point. The sky was heavily overcast and the water was turbid from the previous day's storm. South of Dana Point, scouting conditions were excellent, but few fish schools were sighted. A total of 25 small schools of northern anchovies (Engraulis mordax) were off Camp Pendleton, where a large school group was observed in December 1963. California gray whales (Eschrichtius glaucus) were quite common from Camp Pendleton south.

The flight scheduled for January 21 was cancelled due to bad weather.

Point Vicente to Point Buchon was scouted on January 22. Weather conditions were variable. Good flight weather prevailed south of Jalama Park, but rain and sleet squalls were frequent to the north. One large anchovy school was sighted on the surface in a rough sea near Point Vicente. This was unusual because fish generally stay deep when such turbulence exists.

On January 23, Point Anno Nuevo to Point Dume was scouted. On that day scouting conditions were fair but intermittent cloud formations cast dark shadows on the water's surface causing many false sightings, requiring additional scouting time to verify. Two unidentified schools were seen, one each, near Point Lopez and Cape San Martin, which behaved like Pacific sardines (Sardinops caeruleus) but they were too deep for positive identification. Numerous gray whales were also seen between Point Buchon and Point Sur.

Note: See Commercial Fisheries Review, March 1964 p. 10.

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SEA OTTER POPULATION SURVEY:

Airplane Spotting Flight 64-2-Special Project (January 28-29, 1964): To obtain a visual and photographic count of California sea otters (Enhydra lutris nereis), the Channel Islands and the inshore area from Santa Barbara to Pigeon Point were surveyed from the air by the California Department of Fish and Game's Beechcraft N5614D. California sea otters are thought to range from Cambria to Anno Nuevo Island.

No sea otters were observed at any of the Channel Islands on January 28, although excellent visibility prevailed at the altitudes flown (30 to 150 feet) during the census at all 7 islands.

The inshore area from Santa Barbara to a point about halfway between Anno Nuevo Island and Half Moon Bay was surveyed on January 29. Excellent visibility prevailed at the altitudes flown (generally between 100 and 150 feet, occasionally as low as 30 feet). Sea otters were observed only between Cambria and Monterey Bay. Within that area, 236 sea otters were widely scattered in and near kelp beds; the largest group contained only 15 animals. Decreasing visibility and rain were encountered a few miles north of Anno Nuevo Island and the census was concluded at that point. Photographs were taken with an aerial camera of all sizable groups of sea otters; small groups and single individuals were not photographed.

Two California gray whales were also observed.



Chesapeake Bay

RESEARCH CONFERENCE POINTS UP PROBLEM AREAS:

A joint conference on research problems of the Chesapeake Bay and its tributaries was held at Solomons, Md., on February 7, 1964, by staffs of the marine laboratories of the Virginia Institute of Marine Science and the Natural Resources Institute, University of Maryland.

The laboratories of both Institutes have often joined forces on research projects but expressed further interest in increasing their cooperation and singled out several fields where joint efforts might be of special benefit. Chief among these was the decision by the group to develop a joint research program on the blue crab, which migrates freely between Maryland and Virginia and provides a resource of significant importance to both states. Two scientists, one from each laboratory, were requested to complete detailed planning of the research necessary for effective management of the blue crab.

At the conference, considerable discussion was given to the possibility of surveying tem-

perature conditions throughout Chesapeake Bay, since they trigger the migrations of marine animals, spawning, and many other important activities. The conferees hoped that Virginia's use of airplane to scan surface temperatures in the lower Bay can be extended as a cooperative project to include the upper Chesapeake and its tributaries. In addition, interest was expressed in adding careful observations from boats at a set of stations coincidentally with the plane flight.

Because the deep waters of the Chesapeake Bay tend to move upstream from the ocean toward the headwaters, both laboratories expressed interest in further release of "seabed drifters," which are small plastic umbrella-shaped devices which drift along the bottom of natural currents. During the winter 1962/63, 300 of these were released by the Chesapeake Biological Laboratory and most of them showed movement up the Bay. The Virginia Institute of Marine Science has been releasing about 500 of those drifters each month in a careful pattern in the ocean near the mouth of the Chesapeake Bay and the two laboratories plan to extend this program into the Chesapeake.

Serious discussion was given to a joint study of the croaker, one of the resources of the Bay now in very short supply. Reports from present research indicated, however, that the supply is so small that research in the Bay itself will be very difficult for the next few years. Biologists from the two stations agree that Maryland and Virginia both need to learn more about the croakers now present in North Carolina, since they may affect the supply in the Chesapeake. A joint project may be developed at that location. Additional studies of spot and other indigenous Bay fish species were considered and may develop at a later date.

The Potomac River was a special point of interest, since both laboratories are advisers to the Potomac River Fisheries Commission and because the river is shared by the two states. Particular emphasis was given to the need for evaluating all the present knowledge of that area and to the urgent necessity for research on the enormous amount of waste material flowing into the upper Potomac from the Washington metropolitan region. A joint study is under discussion.

The problems involved in oyster management in the Potomac River were discussed

by members of both groups who will make cooperative recommendations to the Potomac Fisheries Commission.

The directors of both Institutes commented on the high expense of research on the waters which cover about 20 percent of Maryland, a large part of Virginia and extend out to the edge of the Continental Shelf. At the present time, the Chesapeake Biological Laboratory of Maryland is without a research vessel and completely unable to participate in the extensive study necessary to answer each of the questions involved. The directors stressed that the problems of the Bay area are rapidly increasing with population growth and industrialization that must be attacked on a bay-wide basis, since fish and other organisms are highly migratory. The expense of such operations will continue to increase. (Natural Resources Institute, University of Maryland, February 10, 1964.)



Federal Aid for Sport Fish and Wildlife Restoration

FUNDS APPORTIONED TO STATES, FISCAL YEAR 1964:

A final distribution of \$10.2 million in Federal Aid funds for fish and wildlife restoration during fiscal year 1964 has been made to the 50 States, Guam, Puerto Rico, and the Virgin Islands, the U. S. Department of the Interior announced on January 27, 1964. Those funds are in addition to the \$12.6 million released on May 15, 1963, making a total of more than \$22.8 million available for fiscal year 1964, Secretary of the Interior Stewart L. Udall said. Of the total of \$22,828,172.62 released for fiscal year 1964, \$16,673,076 is for wildlife restoration and \$6,155,099 is for fish projects.

The Interior Secretary said funds apportioned to the States will be used for fish and wildlife restoration projects involving the purchase of land, improvement of areas of land or water for fish and wildlife, and to conduct research for the restoration and perpetuation of those resources.

Under the Federal Aid program, the States initiate the projects and, if they meet the requirements established by the Department of the Interior, the funds allocated are used to

reimburse the States up to 75 percent of the cost of completed projects.

The amount allocated for fiscal year 1964 under the Federal Aid in fish and wildlife restoration programs is over \$3.5 million more than the \$19,170,000 apportioned in fiscal year 1963.

| Apportionment for Federal Aid in Fish and Wildlife Restoration, Fiscal Year 1964 | | |
|--|----------------|----------------------|
| State | Fish Projects | Wildlife Restoration |
| Alabama | \$ 107,550.49 | \$ 316,230.29 |
| Alaska | 306,254.95 | 781,394.32 |
| Arizona | 117,544.90 | 357,468.64 |
| Arkansas | 115,584.20 | 284,832.95 |
| California | 306,254.95 | 774,822.87 |
| Colorado | 144,835.05 | 375,321.59 |
| Connecticut | 61,250.99 | 78,139.43 |
| Delaware | 61,250.99 | 78,139.43 |
| Florida | 132,179.75 | 248,215.44 |
| Georgia | 127,672.61 | 291,788.62 |
| Hawaii | 61,250.99 | 78,139.43 |
| Idaho | 100,442.20 | 312,449.38 |
| Illinois | 160,497.13 | 427,040.41 |
| Indiana | 154,324.35 | 459,266.56 |
| Iowa | 110,643.87 | 329,491.88 |
| Kansas | 104,961.83 | 330,860.17 |
| Kentucky | 82,607.26 | 243,061.23 |
| Louisiana | 74,720.41 | 274,207.31 |
| Maine | 64,125.89 | 189,676.16 |
| Maryland | 61,250.99 | 122,599.70 |
| Massachusetts | 61,250.99 | 91,443.70 |
| Michigan | 226,865.98 | 638,339.70 |
| Minnesota | 280,578.89 | 444,846.13 |
| Mississippi | 83,045.53 | 239,424.37 |
| Missouri | 167,260.20 | 376,868.69 |
| Montana | 145,295.75 | 489,907.40 |
| Nebraska | 92,850.58 | 308,285.86 |
| Nevada | 89,786.38 | 302,022.50 |
| New Hampshire | 61,250.99 | 78,139.43 |
| New Jersey | 61,250.99 | 134,953.82 |
| New Mexico | 111,181.00 | 370,205.68 |
| New York | 162,646.41 | 544,657.61 |
| North Carolina | 94,168.71 | 363,248.42 |
| North Dakota | 61,250.99 | 225,908.69 |
| Ohio | 171,549.98 | 486,768.06 |
| Oklahoma | 128,637.61 | 301,780.82 |
| Oregon | 144,196.07 | 428,686.71 |
| Pennsylvania | 135,305.83 | 708,181.50 |
| Rhode Island | 61,250.99 | 78,139.43 |
| South Carolina | 70,093.49 | 181,259.68 |
| South Dakota | 80,333.57 | 316,145.06 |
| Tennessee | 140,630.45 | 365,858.02 |
| Texas | 306,254.95 | 781,394.32 |
| Utah | 90,094.52 | 319,246.78 |
| Vermont | 61,250.99 | 81,858.26 |
| Virginia | 85,496.52 | 318,114.99 |
| Washington | 114,880.94 | 351,134.61 |
| West Virginia | 61,250.99 | 189,281.62 |
| Wisconsin | 227,491.97 | 461,201.12 |
| Wyoming | 92,493.02 | 312,627.75 |
| Guam | 10,000.00 | 10,000.00 |
| Puerto Rico | 10,000.00 | 10,000.00 |
| Virgin Islands | 10,000.00 | 10,000.00 |
| Totals | \$6,155,099.08 | \$16,673,076.54 |

Note: See *Commercial Fisheries Review*, July 1963 p. 36, January 1963 p. 27.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES,
FOURTH QUARTER 1963:

October 1963: FRESH AND FROZEN: For the use of the Armed Forces under the Depart-

ment of Defense, slightly less fresh and frozen fishery products were purchased in October 1963 than in the previous month. (The purchases were made by the Defense Subsistence Supply Centers.) The decline was 1.9 percent in quantity and 1.7 percent in value. In October 1963, leading items were purchased in the following quantities (average price in cents per pound shown in parentheses): shrimp 663,080 pounds (78); scallops 101,100 pounds (56); oysters 101,502 pounds (96); ocean perch fillets 246,190 pounds (32); flounder fillets 225,000 pounds (27); and haddock fillets 182,800 pounds (35). The October purchases also included substantial quantities of halibut, cod fillets, and mackerel.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, October 1963 with Comparisons

| QUANTITY | | | | VALUE | | | |
|--------------------------|-------|-----------|--------|-----------------------|-------|-----------|--------|
| October | | Jan.-Oct. | | October | | Jan.-Oct. | |
| 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Lbs.) | | | | (\$1,000) | | | |
| 1,817 | 2,149 | 19,490 | 20,083 | 975 | 1,585 | 10,917 | 12,560 |

CANNED: Large purchases of canned salmon for the Armed Forces were made in October 1963. Previous purchases of canned salmon in 1963 had been very light and total

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, October 1963 with Comparisons

| Product | QUANTITY | | | | VALUE | | | |
|--------------------------|----------|-------|-----------|-----------------------|---------|-------|-----------|-------|
| | October | | Jan.-Oct. | | October | | Jan.-Oct. | |
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Lbs.) | | | | (\$1,000) | | | | |
| Tuna | 281 | 138 | 2,992 | 3,846 | 123 | 69 | 1,420 | 2,131 |
| Salmon | 1,448 | 2,265 | 1,478 | 3,281 | 875 | 1,150 | 895 | 1,788 |
| Sardine | 24 | 20 | 399 | 85 | 8 | 158 | 39 | |

purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) in the first 10 months of 1963 were down 32.5 percent in quantity and 37.5 percent in value from those in the same period of 1962 due to lower purchases of canned salmon and tuna.

November 1963: FRESH AND FROZEN: Purchases of fresh and frozen fishery products for the Armed Forces in November 1963 were considerably above those in October 1963 due mainly to larger purchases of shell-

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, November 1963 with Comparisons

| QUANTITY | | | | VALUE | | | |
|--------------------------|-------|-----------|--------|-----------------------|------|-----------|--------|
| November | | Jan.-Nov. | | November | | Jan.-Nov. | |
| 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Lbs.) | | | | (\$1,000) | | | |
| 2,232 | 1,893 | 21,722 | 21,976 | 1,206 | 991 | 12,123 | 13,551 |

fish and ocean perch fillets. In November 1963, leading items were purchased in the following quantities (average price in cents per pound in parentheses): shrimp 894,321 pounds (69); scallops 220,975 pounds (57); oysters 148,705 pounds (89); ocean perch fillets 361,510 pounds (311); haddock fillets 163,560 pounds (39); flounder fillets 136,050 pounds (27); halibut 139,047 pounds (37); cod fillets 45,731 pounds (30); sole fillets 30,890 pounds (28); and clams 35,600 pounds (29).

CANNED: There were sizable purchases of each of the three principal canned fishery products in November 1963.

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, November 1963 with Comparisons

| Product | QUANTITY | | | | VALUE | | | |
|--------------------------|----------|-------|-----------|-----------------------|----------|------|-----------|-------|
| | November | | Jan.-Nov. | | November | | Jan.-Nov. | |
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Lbs.) | | | | (\$1,000) | | | | |
| Tuna | 1,011 | 1,013 | 4,003 | 4,859 | 416 | 433 | 1,836 | 2,564 |
| Salmon | 732 | 11 | 2,210 | 3,292 | 433 | 8 | 1,328 | 1,796 |
| Sardine | 59 | 9 | 458 | 94 | 22 | 3 | 180 | 42 |

December 1963: FRESH AND FROZEN: Shrimp, scallops, and groundfish fillets continued to account for a large part of purchases of fresh and frozen fishery products for the Armed Forces in the final month of 1963. In December 1963, leading items were purchased in the following quantities (average price in cents per pound in parentheses): shrimp 518,997 pounds (74); scallops 227,775 pounds (57); oysters 83,520 pounds (99); ocean perch fillets 246,662 pounds (31); flounder fillets 206,244 pounds (29); haddock fillets 73,610 pounds (40); cod fillets 71,638 pounds (30); sole fillets 40,790 pounds (27); salmon 67,226 pounds (64); and halibut 75,680 pounds (38).

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, December 1963 with Comparisons

| QUANTITY | | | | VALUE | | | |
|--------------------------|-------|-----------|--------|-----------------------|------|-----------|--------|
| December | | Jan.-Dec. | | December | | Jan.-Dec. | |
| 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Lbs.) | | | | (\$1,000) | | | |
| 1,678 | 1,380 | 23,400 | 23,356 | 894 | 837 | 13,017 | 14,388 |

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, December 1963 with Comparisons

| Product | QUANTITY | | | | VALUE | | | |
|--------------------------|----------|------|-----------|-----------------------|----------|------|-----------|-------|
| | December | | Jan.-Dec. | | December | | Jan.-Dec. | |
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| (1,000 Lbs.) | | | | (\$1,000) | | | | |
| Tuna | 364 | 748 | 4,367 | 5,607 | 154 | 379 | 1,990 | 2,943 |
| Salmon | 1 | 3 | 2,211 | 3,295 | 1 | 2 | 1,329 | 1,798 |
| Sardine | 31 | 28 | 489 | 122 | 13 | 12 | 193 | 54 |

CANNED: In December 1963, purchases of canned tuna and canned salmon continued to lag behind those in the previous year.

* * * * *

January-December 1963 Summary: FRESH AND FROZEN: Total purchases of fresh and frozen fishery products for the use of the Armed Forces in 1963 were almost the same as those in 1962 and 1961. The value of the fresh and frozen purchases in 1963 was down 9.5 percent from 1962, but up 4.3 percent from 1961. The average price per pound of fresh and frozen purchases in 1963 was 55.6 cents compared with 61.6 cents in 1962 and 53.2 cents in 1961.

In mid-1963, frozen shrimp prices began to decline from the high levels established in 1962. The average price of frozen western halibut also declined in 1963. On the other hand, prices for frozen scallops, ocean perch fillets, and haddock fillets were generally higher in 1963 than in previous year.

CANNED: Total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) in 1963 were down 21.7 percent in quantity and 26.7 percent in value from those in 1962. The value fell more than the quantity because of generally declining prices for the principal canned fishery products in 1963. The total 1963 canned purchases were also down 18.0 percent in quantity and 17.7 percent in value from those in 1961.

With the recovery of the Maine sardine industry in 1962, purchases of canned sardines showed a sharp increase in 1963, but this could not offset declining purchases of the volume items (canned tuna and canned salmon). Purchases of canned tuna in 1963 were down 22.1 percent from 1962 and 38.3 percent from 1961. Purchases of canned salmon in 1963 showed a drop of 32.9 percent from 1962, but a gain of 57.6 percent over 1961.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

(2) See Commercial Fisheries Review, March 1964 p. 16, May 1963 p. 26.

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VETERANS ADMINISTRATION ESTIMATED REQUIREMENTS FOR CANNED FISH FROM 1964 PACKS:

Early this year, the Veterans Administration announced its estimated requirements

for various canned fish products from 1964 packs as follows:

| Veterans Administration Requirements for Canned Fish from 1964 Packs | | |
|--|----------|----------------------|
| Canned Product | Can Size | Quantity (Doz. Cans) |
| Salmon, med. red or coho, skin and backbone on | 4 lb. | 3,000 |
| Salmon, red or sockeye | No. 1 | 10,692 |
| Salmon, red or sockeye | 4 lb. | 1,800 |
| Salmon, red or sockeye, dietetic | No. 1/2 | 9,300 |
| Sardines | No. 1 | 4,500 |
| Tuna, light meat, chunk, in vegetable oil | 4 lb. | 7,500 |
| Tuna, dietetic | No. 1/2 | 11,000 |



Filleting Machine

YELLOW PERCH FILLETING MACHINE NOW IN OPERATION IN GREAT LAKES REGION:

The United States manufacturers of a yellow perch filleting machine have announced that they now have a prototype machine in operation at Sheboygan, Wis. The filleting machine processed about 50,000 pounds of round yellow perch during the first month's operation.

After being headed and scaled, the fish are fed into the machine at a rate of about 1,000 pounds an hour. The machine produces approximately 500 pounds of fillets from that amount of headed and scaled fish. Less than 5 percent of the fillets produced require additional hand trimming. The fillet yield is about 2½ percent less than that of a hand-filleting operation. The cost of the machine is reported to be \$8,500 net, f.o.b. factory (Gladstone, Mich.).



Fish Meal

PLANT BEING BUILT IN GREAT LAKES REGION:

A fish-meal processing plant is being built at Milwaukee, Wis., at a reported cost of \$250,000. It is the first major development of this type in the Great Lakes area and when completed this spring will process low-value fish (principally alewives) caught in the Great Lakes into fish meal for use in poultry and livestock feeds. The Milwaukee firm building the plant is a distributor of fresh fish and processes its less marketable catch for use

by pet food producers and mink ranchers. The firm has 2 of the 7 trawlers now operating out of western Lake Michigan ports. (Great Lakes News Letter, November-December 1963.)



Great Lakes

LAKE TROUT HATCHERY AND PLANTING PROGRAM:

More than 2.3 million young lake trout were planted in Lake Superior during 1963, according to the Great Lakes Fishery Commission. Yearling trout planted by participating Federal, state, and Canadian provincial agencies totaled about 1,974,000 and fingerlings accounted for an additional 350,000. The previous high for this restocking program was set in 1962 when 1,853,000 yearling and fingerling lake trout were planted in Lake Superior.

A survey in mid-1963 of young lake trout being reared in state, Federal, and Canadian provincial hatcheries indicated that about 2.7 million yearlings will be available for planting in Lake Superior during the spring of 1964. The new Jordan River Federal fish hatchery, under construction in the northern section of Michigan's lower peninsula, is expected to increase sharply the hatchery stock of lake trout. Construction of that hatchery was sufficiently advanced in the fall of 1963 so that it could be used at that time to provide yearlings for planting in early 1965. With the Jordan River hatchery in operation, about 5 to 5.5 million yearling lake trout will be available annually for the Great Lakes rehabilitation program. (Great Lakes News Letter, September-October 1963.)

* * * * *

CONTRACT FOR WATER RESEARCH IN LAKE MICHIGAN AWARDED BY U. S. PUBLIC HEALTH SERVICE:

A \$1 million contract for research on Lake Michigan has been awarded to the University of Michigan by the U. S. Public Health Service. A principal aim of the four-year study is to determine the effects of man's uses of the Lake and how fast his use is changing water quality. Another major purpose is to investigate the Lake's effect on weather. The research will be carried out by the University's Great Lakes Research Division and

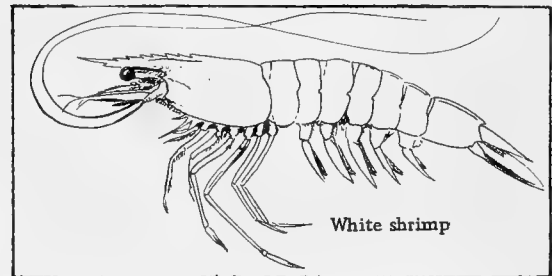
will be principally in the section of the Lake south of Milwaukee and Muskegon. The Division's three research ships will be involved in extensive sampling of the Lake for chemical and biological analysis of the water and bottom sediments. The project is designed to provide information needed for planning future management of the Lake and preservation of its water quality. (Great Lakes News Letter, September-October 1963.)



Gulf Exploratory Fishery Program

SHRIMP AND MENHADEN INVESTIGATIONS IN THE GULF OF MEXICO:

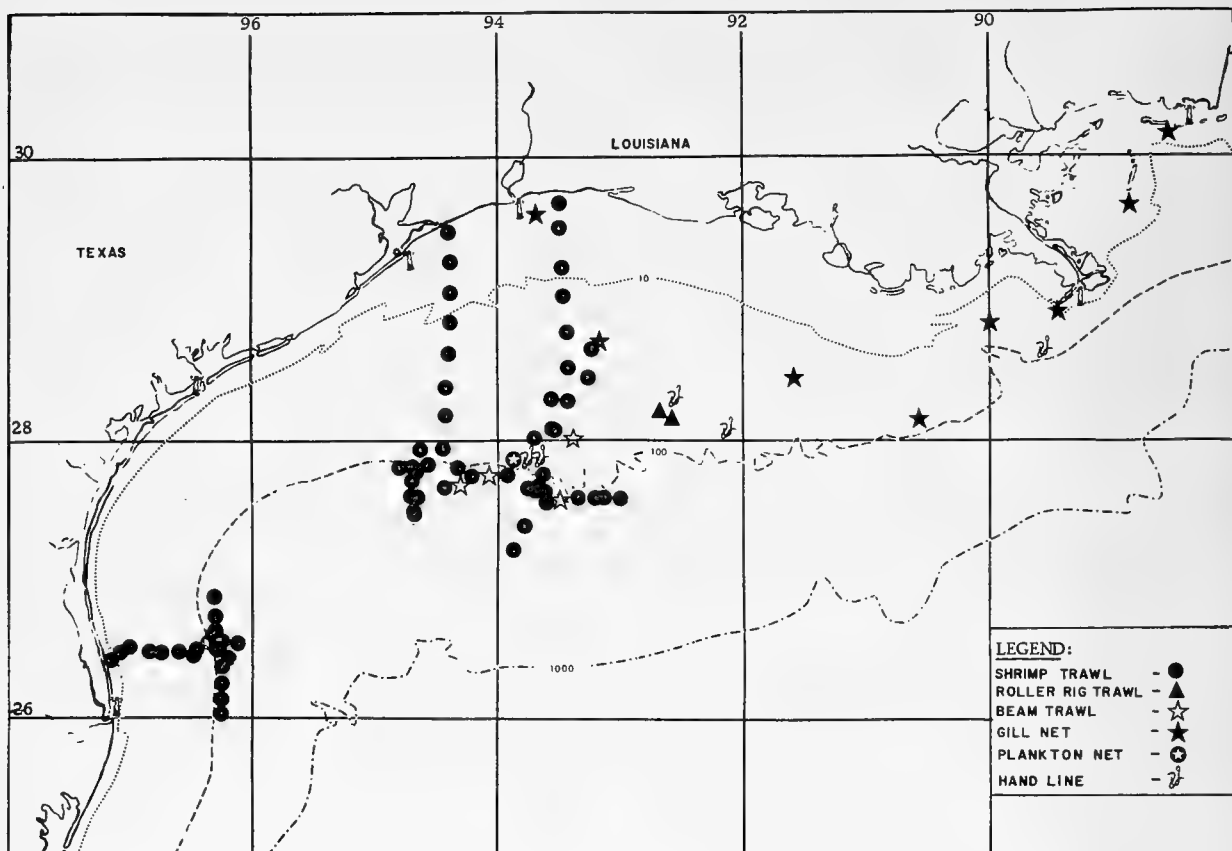
M/V "Oregon" Cruise 89 (January 13-February 5, 1964): The principal objectives of this 24-day cruise along the Texas coast by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon were to: (1) obtain additional information on the seasonal abundance of brown shrimp (Penaeus aztecus), pink shrimp (P. duorarum), white shrimp (P. setiferus), and royal-red shrimp (Hymenopenaeus robustus); (2) conduct deep-water faunal transects; and (3) investigate off-season menhaden resources in the northwest area of the Gulf of Mexico.



White shrimp

Catches of inshore shrimp on this cruise were light with 30 drags in depths of 4 to 50 fathoms yielding 86 pounds of brown shrimp, 7½ pounds of pinks, and 35½ pounds of whites. Brown shrimp were predominant from depths of 17 to 32 fathoms, pinks at 12 fathoms, and whites at 9 fathoms.

Royal-red shrimp were also caught in light quantities at depths from 200 to 300 fathoms where the bottom temperature ranged between 46.1° and 51.3° F. A total of 30 drags yielded 87 pounds of that species with the largest catch consisting of 12 pounds taken in 240 fathoms off Brownsville, Texas.



Areas investigated along Texas coast during Cruise 89 of the M/V Oregon (January 13-February 5, 1964).

Deep-water transects were conducted from 50 to 500 fathoms with rattail (Macrouridae) fish dominating the catches. Bottom trawling on the 400-fathom curve was not possible due in part or wholly to strong currents. Neither the abundance nor the variety of the fauna was like that found at similar depths in other regions of the Gulf, notably off the Tortugas.

Investigations on the off-season menhaden abundance were continued with 16 gill-net stations being occupied. Those stations were equally divided between bottom and surface sets in 5- to 50-fathom depths. Gill nets used were of No. 7 monofilament nylon, constructed of five 300-foot sections of $2\frac{1}{2}$ -, $2\frac{5}{8}$ -, $2\frac{3}{4}$ -, $2\frac{7}{8}$ -, and 3-inch stretch mesh. About 89 adult large-scale menhaden (Brevoortia patronus) were caught in surface nets. Fifty-two of those fish were caught in 20 fathoms in spawning condition.

The newly acquired West Coast-type gill-net hauler greatly facilitated the handling of exceedingly long monofilament nets.

In addition to gill-net catches, 125 juvenile menhaden were taken in a 65-foot shrimp trawl that was fished in 5 fathoms of water.

Note: See Commercial Fisheries Review, February 1964 p. 24.

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SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 49 (January 22-February 12, 1964): To evaluate the effectiveness of the electrical shrimp trawl in daylight fishing on the Key West-Tortugas shrimp grounds was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers. Results were similar to those obtained on the Apalachicola offshore grounds during the vessel's previous cruise (Cruise 48, November 6-27, 1963). As estimated from night trawling with standard gear, catches during daylight hours ranged from 20 to 60 percent of what was available.

In an attempt to increase the daytime catch, a number of factors were investigated. These included pulse width, pulse power, pulse repe-



The U. S. Bureau of Commercial Fisheries exploratory fishing vessel, George M. Bowers.

tion rate, and electrode length (pulses per shrimp). With the exception of pulse width, an increase in the value of those parameters did not markedly affect the catch. An improvement resulted when the pulse width was increased from about 10 microseconds to 100 microseconds. Further lengthening of the pulse, however, did not affect the catch rate.

The daylight electric trawl catch was typical since it was composed of large shrimp only (20-30 count), whereas night catches contained large shrimp as well as smaller sizes not caught during the day.

Indications were that burrowed shrimp were responding to the electrical field but all were not clearing the bottom. To examine that possibility, laboratory experiments using the cohesive Tortugas mud were to be conducted.

Note: See Commercial Fisheries Review, February 1964 p. 22.

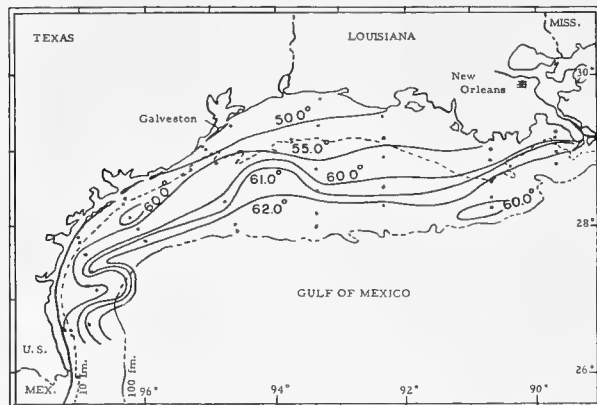


Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-13 (January 18-30, 1964): Shrimp investigations in the Gulf of Mexico were expanded to include the collection of additional oceanographic data during this cruise of the chartered research Gus III. The vessel is operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Galveston, Tex. As part of the enlarged study, a total of 53 bathythermograph casts, 20 Nansen bottle casts, 26 plank-

ton tows, 16 paired plankton tows, and 21 plankton sled tows were made. Successful plankton sled tows were made at 200 fathoms.



M/V Gus III Cruise GUS-13 (January 18-30, 1964).

During shrimp sampling at established stations, catches were generally light with only a few isolated hauls yielding fair results. Eight statistical areas (13, 14, 16, 17, 18, 19, 20, and 21) off Louisiana and Texas were covered. Thirty-two 3-hour tows with a 45-foot flat trawl were made.

Area 14 produced the largest catch which consisted of 41 pounds of 51-67 count white shrimp from under 10 fathoms. In area 18, a tow in over 20 fathoms yielded 37 pounds of 12-15 count brown shrimp. In area 16, a catch of 12 pounds of 26-30 count brown shrimp was taken from the 10-20 fathom depth. Area 17 yielded 9 pounds of 26-30 count brown shrimp from 10-20 fathoms, and area 13 produced 7 pounds of 31-40 count brown shrimp from the same depth. Pink shrimp were found in traces in a few tows, but the quantity in each case was less than one pound.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, Feb. 1964 p. 27.



Hawaii

SKIPJACK TUNA LANDINGS, JANUARY 1964:

Skipjack tuna landings in Hawaii in January 1964 were about 475,000 pounds. This was 176,000 pounds above the 1948-1963 average for the month. During January there were 80 productive trips giving an average of 4,473 pounds per trip. Individual catches ranged from

147 pounds to 13,685 pounds. Oahu-based vessels landed 94 percent of the total catch.



Industrial Fishery Products

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, 1962-63: Based on domestic production and imports, the United States available supply of fish meal for 1963 amounted to 624,003 short tons--60,464 tons (or 10.7 percent) more than during 1962. Domestic production was 69,586 tons (or 22.4 percent) less, but imports were 130,050 tons (or 51.5 percent) higher than in 1962. Peru continued to lead other countries with shipments of 291,544 tons.

The United States supply of fish solubles (including homogenized fish) during 1963 amounted to 102,997 tons--a decrease of 21.2 percent as compared with the same period in 1962. Domestic production dropped 22.6 percent, but imports were up 7.4 percent.

| U. S. Supply of Fish Meal and Solubles, 1962-63 | | |
|---|------------------|----------------|
| Item | 1/1963 | 1962 |
| | ..(Short Tons).. | |
| Fish Meal and Scrap: | | |
| <u>Domestic production:</u> | | |
| Menhaden | 179,971 | 238,680 |
| Tuna and mackerel | 21,626 | 26,559 |
| Herring | 7,425 | 5,095 |
| Other | 32,624 | 40,898 |
| Total production | 241,646 | 311,232 |
| <u>Imports:</u> | | |
| Canada | 50,925 | 42,806 |
| Peru | 291,544 | 186,249 |
| Chile | 23,533 | 9,247 |
| So. Africa Republic | 12,296 | 10,084 |
| Other countries | 4,059 | 3,921 |
| Total imports | 382,357 | 252,307 |
| Available fish meal supply | 624,003 | 563,539 |
| Fish Solubles: | | |
| <u>Domestic production</u> 2/ | 96,224 | 124,334 |
| <u>Imports:</u> | | |
| Canada | 2,034 | 1,335 |
| Iceland | 55 | 2,332 |
| So. Africa Republic | 411 | 1,717 |
| Other countries | 4,273 | 924 |
| Total imports | 6,773 | 6,308 |
| Available fish solubles supply | 102,997 | 130,642 |
| 1/Preliminary. 2/50-percent solids. Includes production of homogenized condensed fish. | | |

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, December 1963: During December 1963, a total of 7,954 tons of fish meal and scrap and over 6 million pounds of oil was produced in the United States. Compared with December 1962, this was an in-

crease of 5,271 tons of fish meal, and 5.4 million pounds of oil. The increases were due to a good menhaden catch off North Carolina in December 1963. One year ago this fishery resulted in a failure that was caused by bad weather.

| U. S. Production of Fish Meal, Oil, and Solubles, December 1963 ^{1/} with Comparisons | | | | |
|---|----------------------------|--------------|----------------|----------------|
| Product | December | | Jan.-Dec. | |
| | 1/1963 | 1962 | 1/1963 | 1962 |
| | (Short Tons) | | | |
| Fish Meal and Scrap: | | | | |
| Herring | 2/ | 25 | 7,425 | 5,095 |
| Menhaden 3/ | 6,067 | 308 | 179,971 | 238,680 |
| Sardine, Pacific | 1 | - | 27 | 702 |
| Tuna and mackerel | 1,356 | 1,649 | 21,626 | 26,559 |
| Unclassified | 530 | 701 | 20,597 | 27,377 |
| Total | 7,954 | 2,683 | 229,646 | 298,413 |
| Shellfish, marine animal meal and scrap | 4/ | 4/ | 12,000 | 12,819 |
| Grand total meal and scrap | 4/ | 4/ | 241,646 | 311,232 |
| Fish Solubles: | | | | |
| Menhaden | 2,224 | 125 | 73,970 | 84,885 |
| Other | 526 | 1,581 | 15,030 | 28,353 |
| Total | 2,750 | 1,706 | 89,000 | 113,238 |
| Homogenized condensed fish | - | 132 | 7,224 | 11,096 |
| | (1,000 Pounds) | | | |
| Oil, body: | | | | |
| Herring | 2/ | 170 | 5,726 | 5,255 |
| Menhaden 3/ | 5,342 | 69 | 165,037 | 237,815 |
| Sardine, Pacific | - | - | 4 | 166 |
| Tuna and mackerel | 379 | 343 | 5,654 | 5,175 |
| Other (including whale) | 362 | 97 | 7,588 | 7,397 |
| Total oil | 6,083 | 679 | 184,009 | 255,808 |
| 1/Preliminary data. 2/Included with unclassified. 3/Includes a small quantity of thread herring. 4/Not available on a monthly basis. Note: Beginning with February 1963, fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon. | | | | |

The quantity of fish solubles manufactured in December 1963 amounted to 2,750 tons or 61 percent more than in December 1962. Menhaden solubles accounted for 81 percent of the total solubles manufactured.

The 1963 production of fish meal amounted to 241,646 tons. This was a decrease of 69,586 tons or 22 percent compared with 1962. Menhaden meal decreased 58,709 tons or 25 percent. The oil yield for 1963 amounted to 184 million pounds, a decrease of 72 million pounds or 28 percent as compared with 1962. Production of fish solubles and homogenized condensed fish decreased 28,110 tons or 23 percent in 1963.

Production by Areas, January 1964: Preliminary data on U. S. production of fish meal, oil, and solubles for January 1964 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

| U. S. Production ^{1/} of Fish Meal, Oil, and Solubles, January 1964 (Preliminary) with Comparisons | | | | |
|---|------------|--------------|------------------------------|---------------------------|
| Area | Meal | Oil | Solubles | Homogenized ^{3/} |
| | Short Tons | 1,000 Pounds | (Short Tons) | |
| January 1964: | | | | |
| East & Gulf Coasts. | 799 | 160 | 74 | - |
| West Coast ^{2/} . . . | 1,688 | 236 | 1,166 | - |
| Total | 2,487 | 396 | 1,240 | - |
| Jan. 1963 Total . . | 2,285 | 424 | 1,391 | 50 |

1/Does not include crab meal, shrimp meal, and liver oils.
 2/Includes American Samoa and Puerto Rico.
 3/Includes condensed fish.
 Note: Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

* * * * *

Major Indicators for U. S. Supply, January 1964 and December 1963: United States production of fish meal in January 1964 was higher by 8.8 percent as compared with January 1963. Production of fish solubles and fish oil was down by 13.9 and 6.6 percent, respectively.

| Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, January 1964 | | | | | |
|--|---------|-----------|---------|---------|---------|
| Item and Period | 1/1964 | 1/1963 | 1962 | 1961 | 1960 |
| (Short Tons) | | | | | |
| Fish Meal: | | | | | |
| Production: | | | | | |
| January | 2/2,487 | 2/2,285 | 2,941 | 2,723 | 3,828 |
| February | 2/ | 2/2,847 | 3,616 | 2,071 | 3,116 |
| Jan.-Dec. | 2/ | 2/229,646 | 298,413 | 291,337 | 270,343 |
| Year ^{3/} | 2/ | 2/241,646 | 311,232 | 311,265 | 290,137 |
| Imports: | | | | | |
| January | - | 18,495 | 25,427 | 9,531 | 8,571 |
| February | - | 40,086 | 18,819 | 14,344 | 8,081 |
| Year | - | 383,107 | 252,307 | 217,845 | 131,561 |
| Fish Solubles ^{4/}: | | | | | |
| Production: | | | | | |
| January | 1,240 | 1,441 | 1,808 | 1,620 | 1,697 |
| February | - | 1,223 | 1,726 | 1,650 | 1,812 |
| Year | - | 96,224 | 124,334 | 112,241 | 98,929 |
| Imports: | | | | | |
| January | - | 148 | 273 | 219 | 214 |
| February | - | 169 | 2,249 | 155 | 1,875 |
| Year | - | 6,773 | 6,308 | 6,739 | 3,174 |
| Fish Oils: | | | | | |
| Production: | | | | | |
| January | 396 | 424 | 763 | 489 | 534 |
| February | - | 324 | 408 | 366 | 554 |
| Year | - | 184,009 | 255,808 | 266,668 | 215,653 |
| Exports: | | | | | |
| January | - | 79 | 509 | 13,449 | 2,068 |
| February | - | 2,458 | 21,647 | 17,456 | 23,828 |
| Year | - | 262,342 | 123,050 | 122,486 | 143,659 |

1/Preliminary.
 2/Preliminary data for 1963 and 1964 based on reports which accounted for the following percentage of production in 1962: Fish meal, 93 percent; solubles and homogenized fish, 97 percent; and fish oils, 95 percent.
 3/Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.
 4/Includes homogenized fish.

| Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oils, December 1963 | | | | | |
|---|-----------|---------|---------|---------|---------|
| Item and Period | 1/1963 | 1962 | 1961 | 1960 | 1959 |
| (Short Tons) | | | | | |
| Fish Meal: | | | | | |
| Production: | | | | | |
| January | 2,285 | 2,941 | 2,723 | 3,828 | 3,095 |
| December | 2/8,391 | 2,683 | 12,763 | 9,178 | 15,378 |
| Jan.-Nov. | 2/221,056 | 295,730 | 278,574 | 261,165 | 266,866 |
| Year ^{3/} | - | 311,232 | 311,265 | 290,137 | 306,551 |
| Imports: | | | | | |
| January | 18,495 | 25,427 | 9,531 | 8,571 | 19,700 |
| December | - | 18,977 | 23,268 | 15,564 | 5,508 |
| Jan.-Nov. | 352,628 | 233,330 | 194,577 | 115,997 | 127,417 |
| Year | - | 252,307 | 217,845 | 131,561 | 132,925 |
| Fish Solubles^{4/}: | | | | | |
| Production: | | | | | |
| January | 1,441 | 1,808 | 1,620 | 1,697 | 1,913 |
| December | 2/3,257 | 1,838 | 4,936 | 2,897 | 5,429 |
| Jan.-Nov. | 2/94,398 | 122,496 | 107,305 | 96,032 | 159,930 |
| Year | - | 124,334 | 112,241 | 98,929 | 165,359 |
| Imports: | | | | | |
| January | 148 | 273 | 219 | 214 | 1,567 |
| December | - | 387 | 472 | 60 | 420 |
| Jan.-Nov. | 3,613 | 5,921 | 6,267 | 3,114 | 26,210 |
| Year | - | 6,308 | 6,739 | 3,174 | 26,630 |
| Fish Oils: | | | | | |
| Production: | | | | | |
| January | 424 | 763 | 489 | 534 | 497 |
| December | 2/5,732 | 679 | 11,562 | 7,981 | 14,094 |
| Jan.-Nov. | 2/177,972 | 255,129 | 255,106 | 207,672 | 179,230 |
| Year | - | 255,808 | 266,668 | 215,653 | 193,324 |
| Exports: | | | | | |
| January | 79 | 509 | 13,449 | 2,068 | 6,735 |
| December | - | 172 | 10,484 | 15,807 | 19,586 |
| Jan.-Nov. | 229,080 | 122,878 | 112,002 | 127,852 | 124,895 |
| Year | - | 123,050 | 122,486 | 143,659 | 144,481 |

1/Preliminary
 2/Preliminary data for 1963 based on reports which accounted for the following percentage of production in 1962: Fish meal, 93 percent; solubles and homogenized fish, 97 percent; and fish oil, 95 percent.
 3/Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.
 4/Includes homogenized fish.



Marketing

EDIBLE FISHERY PRODUCTS PROSPECTS IN 1964:

The outlook for supplies of edible fishery products in 1964 is expected to be little changed from previous years. The total United States catch may again decline, but more fishery products are expected to be imported. Major items for which import increases are expected include ocean perch and cod fillets, shrimp, tuna, scallops, and spiny lobster tails.

Frozen stocks of fish and shellfish on hand as 1964 began were larger than a year earlier. Canned fish stocks were down, with the exception of pink salmon and shrimp, due to smaller 1963 packs. A substantial increase in the 1963 domestic shrimp landings combined with a continuing high level of imports have resulted in

an unusually large carryover in shrimp stocks (frozen and canned). Large inventories of frozen Great Lakes chubs, fish sticks and fish portions, flounder, halibut and ocean perch fillets and steaks, crab meat, scallops, shrimp (both frozen and canned), and canned pink salmon were on hand as 1964 began.

Supplies of most major species were adequate for the early 1964 Lenten season and during the remainder of the year. Increased United States imports are expected to offset a small decline in the total domestic fishery landings anticipated for 1964.

Retail prices of some major fishery products will most likely strengthen during the year. Fresh and frozen shrimp and canned tuna prices, in particular, may firm up. Little change is expected in the United States per capita consumption of all fishery products in 1964.

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the Department of Agriculture's January 1964 issue of the National Food Situation (NFS-107).



National Fisheries Center

TRAINED DOLPHINS WILL BE FEATURED:

When the National Fisheries Center and Aquarium opens in Washington, D. C., some time about 1967, it will feature a collection of unusually active aquatic animals. To help accustom them to their new habitat and make them carry out their natural activities more frequently, the Fisheries Center has engaged Keller Breland, a nationally-known animal behaviorist and psychologist, announced the U. S. Department of the Interior on February 2, 1964.

More than 7,000 animals have been trained by Breland and his wife since 1950, most of them at their farm in Hot Springs, Ark. Both have doctors degrees in psychology and have trained more than 40 different species of animals. Breland's training of dolphins and other aquatic animals at the National Fisheries Center will have the basic purposes of making the Center more useful as a scientific and educational facility, and at the same time, obtain results that will be of high interest to spectators.

Planners for the Fisheries Center are trying to prepare the nearest thing to natural

habitats for the marine mammals and fish. An aquatic animal is inhibited by captivity, and research scientists at the Center wish to study its natural behavior. Breland's work at the National Fisheries Center will be a departure from his usual training of aquatic animals. At the Marine Studios in Florida and the Marineland of the Pacific in California he trained dolphins to seize a baton or jump through a hoop. At the Fisheries Center, the leap of the dolphin will be more natural, without the frills of a public show. The trainer will not be trying to create a circus. Instead, he will be trying to make the dolphin behave naturally in a near-natural habitat for the benefit of both scientists and public viewers.

What the trainer will get in the beginning is a newly-captured dolphin, a creature that fears its new surroundings and has never eaten a thawed-out frozen fish. He will flip the dead fish in the water to make it appear alive, and gradually the dolphin will come closer to his food. Eventually it will grab the fish and make a panicked retreat. If the dolphin happens to grab one of the trainers fingers, it will let loose. The dolphin has up to 100 spiked teeth, but it seldom leaves a tooth mark on a human. The dolphin's fear will begin to subside as it learns to take the fish more slowly. Then it will learn to wait for a pat on the head before it can take the fish. A pat on the head and a scratch on the stomach will follow and within a month, the dolphin will allow itself to be picked up by the trainer before it gets the fish.

The trainer's technique is based on a reward for the desired response. When an animal does something wrong, the incorrect action is ignored. Punishment and fear are never used in training. After the dolphin learns to eat dead fish, a feeder will be installed in its raceway. The dolphin will be taught that every time he hears a certain signal, he can go to the feeder and find that a fish has been released. Next a photocell will be installed on the sides of the raceway, just above the surface of the water. The dolphin's natural curiosity soon will cause him to stick his head out of the water at the right place. When he does, the photocell beam will be broken and the signal will sound. The dolphin will dive to the feeder box. Now the photocell beam will be gradually raised to higher elevations. The dolphin has to leap higher and higher to break the beam and may leap as high as 15 feet to get his reward. A further refinement

is a background signal--a light or supersonic tone--to let the dolphin know when the feeder circuit is in operation. He will learn that without this signal, there is no point in jumping. In that way, his leaps will be confined to periods when they are desired.

Dolphins at the National Fisheries Center will be taught to broadjump, an accomplishment never before seen in public. The dolphins will learn to leap, then travel up to 25 feet in a horizontal line to break two photocell beams. Another first achievement in public demonstration will be the dolphin's ability to use sonar to find food and avoid obstacles in murky water. Study of this capability will have important scientific benefits. The dolphin will be blindfolded by placing small rubber cups over his eyes. He will send out high-frequency signals and use the bounced-back signals to find a designated target. As he scans for the hidden object, the audience will be able to watch his underwater search. Spectators also will see the dolphin's high frequency signals registered on an oscilloscope. And sound transducers will lower the frequencies to an audible range so the signals can be heard as pings. The dolphin will "home-in" on the target, touch it with his nose and dart to the feeder box for his reward.

The dolphin's natural sonar is much more efficient than the similar manmade device, according to Breland, who said that researchers would like to duplicate the original sonar of the dolphin. They also are interested in the ease with which he moves through water, causing only a minimum of turbulence and drag. More than streamline design and smooth skin are involved. As the dolphin moves through the water, his skin ripples, matching the turbulence and reducing it. Finally, there will be attempts to train the dolphin in the use of his audible "voice." These sounds come from his blowhole, and while the source is not known, Breland said they are not the sounds of breathing. It is already possible to teach the dolphin to make whining and "raspberry" sounds for controlled periods of time, but the trainer now wants to increase the range of sounds and shape them into patterns that resemble such human words as "thank you." "This won't mean that the dolphin will be speaking the human language," Breland said, "but it will show the vast degree to which he can learn different patterns of behavior."

The National Fisheries Center will be operated by Interior Department's Bureau of Sport Fisheries and Wildlife. The Bureau will provide research laboratories at the Center for its own scientists, for those of other Federal Government agencies, and for scientists of other countries. Planning for the Center has reached the point where design criteria soon will be turned over to the architects. Congress has authorized the \$10 million research and educational facility with the proviso that construction and operating costs be repaid to the Federal Treasury. This will be accomplished by charging admission, except to student groups. As a result, the Center will impose no costs on taxpayers.

Aquatic animals from all parts of the world will be placed under the closest scrutiny ever achieved in a single location. The studies will include research into genetics, reproduction, nutrition, fish diseases, antibiotics produced by marine animals, and experimental ecology.

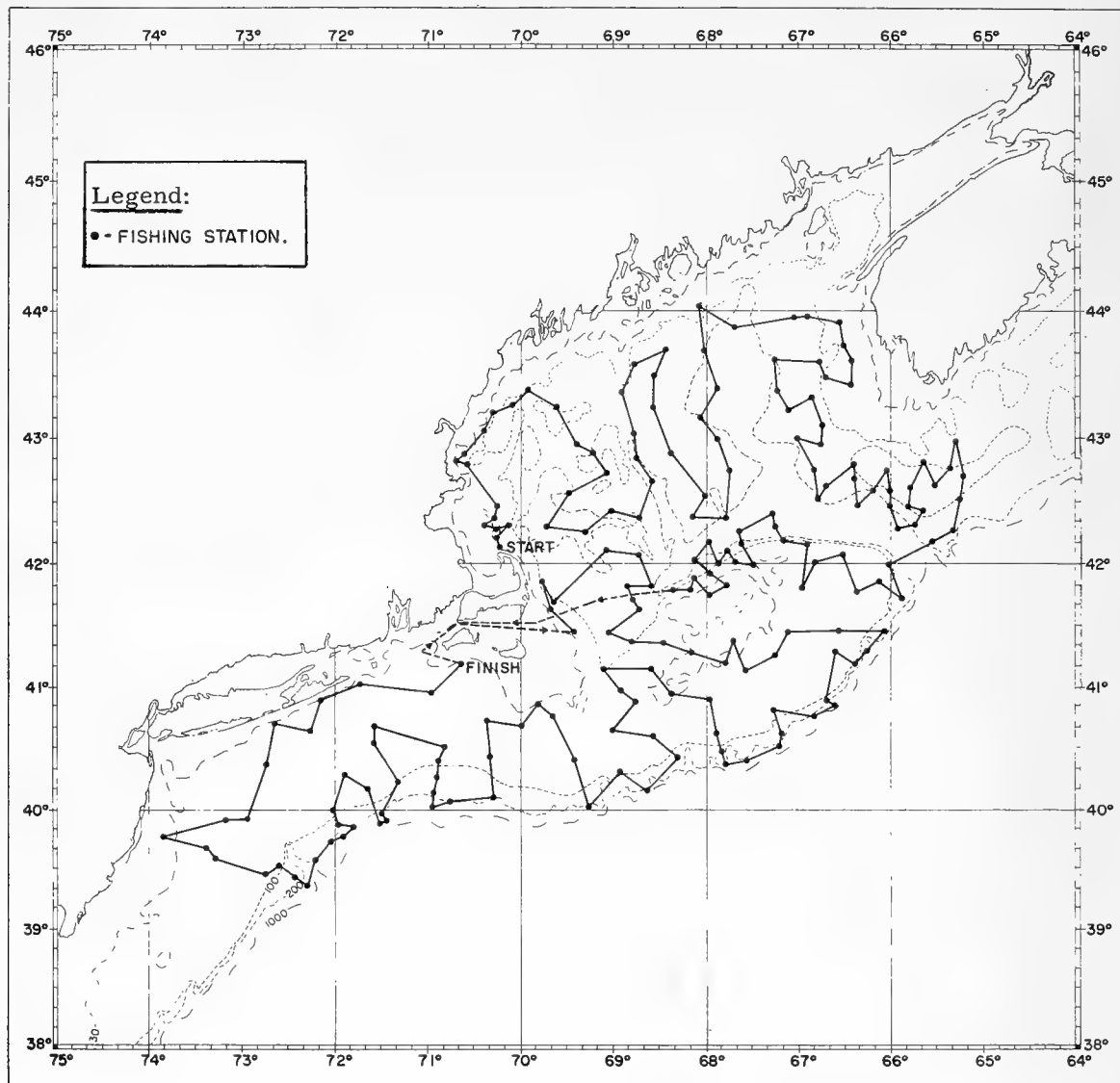


North Atlantic Fisheries Investigations

WINTER DISTRIBUTION AND ABUNDANCE OF GROUND FISH SPECIES STUDIED:

M/V "Albatross IV" Cruise 64-1 (January 16-February 15, 1964): To determine the winter distribution and relative abundance of groundfish species from Nova Scotia southward to New Jersey and to study the food of a number of groundfish species were the purposes of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. The area of investigations southward from Nova Scotia extended to the Continental Shelf and to New Jersey, including Browns Bank, Georges Bank, and the inshore waters along the coast.

A total of 194 groundfish survey stations were completed on this cruise and all fish captured were identified and measured. The stomach contents of 3,159 fish of 40 species were examined and recorded in the study area. Scale samples were taken from 1,280 haddock and 473 yellowtail flounder. Otoliths were extracted from 195 silver hake and 136 cod at selected stations. A sample of sea herring was collected and frozen for the Bureau of Commercial Fisheries Biological Laboratory at Boothbay Harbor, Me. Invertebrates taken by the trawl at each station were preserved for further identification.



Shows the station pattern for Cruise 64-1 of the research vessel Albatross IV, January 16-February 15, 1964.

In the northern part (Gulf of Maine), whiting (silver hake) were caught mainly in the deep water from 50 to 140 fathoms, while in the southern part (south of Georges Bank) whiting were taken in slightly shoaler water from 50-100 fathoms. Spiny dogfish were also caught in the deep water in the north but were abundant in the shoal water in the south. Scup were noticeably absent from all catches throughout the sampling area. Squid were generally absent in the northern part but

abundant on the southern New England grounds. Haddock were abundant north of Cape Cod especially on Georges Bank and on Browns Bank with a few specimens taken south of Cape Cod. Pollock were taken north of Cape Cod with a few specimens caught on the southern New England grounds.

The distributions of many of the species related to depth and temperature were to be determined at a later date.



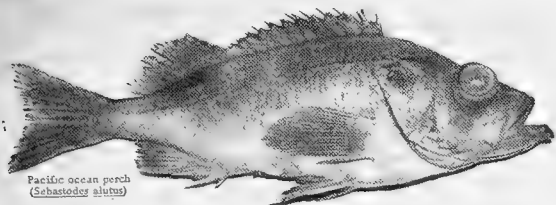
North Pacific Exploratory Fishery Program

SURVEY OF DEEP-WATER MARINE FAUNA OFF MOUTH OF COLUMBIA RIVER CONTINUED:

M/V "John N. Cobb" Cruise 63 (January 8-22, 1964): To monitor deep-water marine fauna at stations off the mouth of the Columbia River was the primary objective of this 15-day cruise by the U. S. Bureau of Commercial Fisheries exploratory vessel John N. Cobb. It was the 13th survey cruise on the cooperative study of demersal fauna off the Columbia River conducted by the U. S. Bureau of Commercial Fisheries and the Atomic Energy Commission. The John N. Cobb has made 4 cruises on this study and 9 cruises were made by the chartered vessel Commando.

Stormy weather greatly hampered fishing operations during this cruise and only 5 of the 17 stations established along the track-line were monitored. All of those stations were at depths of 200 fathoms or less. An eastern otter trawl with a 1½-inch liner in the cod end was used to sample the fauna.

English sole (Parophrys vetulus), rex sole (Glyptocephalus zachirus), and skates (Raja sp.) dominated the catch at the 50-fathom station. Green-striped rockfish (Sebastes elongatus) was the most abundant species at the 75-fathom station. A total of 400 pounds of sablefish (Anoplopoma fimbria) and turbot (Atheresthes stomias) were caught in a one-hour tow at 200 fathoms. The largest catch of ocean perch (Sebastes alutus) for a total of 350 pounds was also taken at 200 fathoms. Like past winter cruises Dover sole (Microstomus pacificus) and hake (Merluccius productus) were virtually absent from the catches in all the tows.



Bottom temperatures and salinity samples were taken at all stations sampled with the trawl. Samples of the fauna collected for the Atomic Energy Commission were delivered to the Laboratory of Radiation Biology, University of Washington, Seattle, Wash.

A biologist from the Fish Commission of Oregon was aboard the vessel during the cruise to tag Dover sole and sablefish for migratory information.

Note: See Commercial Fisheries Review, January 1964 p. 23.



Oceanography

DEEP-DIVING SUBMARINE FOR WOODS HOLE OCEANOGRAPHIC INSTITUTION:

The Alvin, a 22-foot research submarine designed to dive 6,000 feet into the ocean, is scheduled for delivery in the spring of 1964 to the Woods Hole (Mass.) Oceanographic Institution. Design specifications of the vessel are: weight, 11 tons; maximum speed, 6 knots; and endurance at a speed of 2.5 knots, 10 hours. The 2-man craft was financed by a \$575,000 grant from the U. S. Office of Naval Research as part of its Deep Research Vehicle Program.

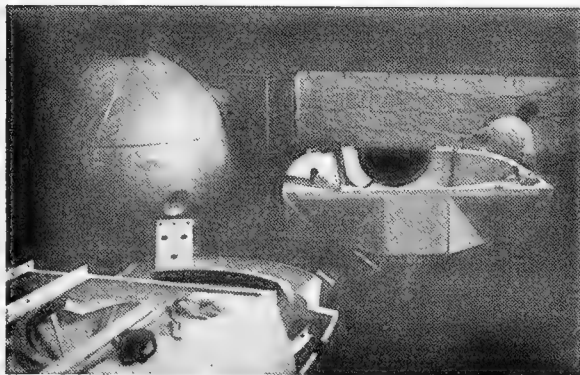


Fig. 1 - Lower section and sphere of the Alvin.

Purpose: The Alvin has been designed as a sophisticated tool for marine investigations. It will not be possible to state what work the Alvin will accomplish until thorough tests are completed; however, scientists believe the vessel will have multiple uses.

In the study of biology, a deep-diving vehicle would make it possible for scientists to observe marine life in its natural habitat. Observations of the concentrations and behavior of marine populations at great depth, not now possible except with cameras, could be made directly by scientists or recorded with manually-operated cameras. This would include observations of bottom populations, as well as the "scattering layer" of marine life which rises toward the surface at night and descends at daylight.

In the study of geology, a craft of this type would enable scientists to observe the topography and composition of the bottom (within the craft's range) more comprehensively than is now possible with camera and television equipment. Interesting samples could be collected as they are sighted, whereas now relatively hit-or-miss systems of dredging are used.

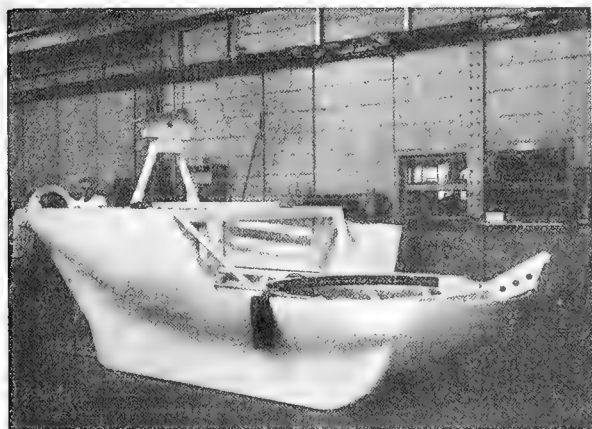


Fig. 2 - The Alvin's lower section with a fibreglass hull.

In the study of physical oceanography, a deep-diving vehicle might be able to measure speed and direction of currents by trimming to neutral buoyancy and logging its own course. By drifting slowly downward through a water column the Alvin could obtain excellent continuous profiles of temperature, salinity, and other water characteristics.

The scientific uses of such a craft would not be limited to those described above, which are mentioned only as examples of the types of work which might be accomplished.

The maximum operating depth called for in the design of the Alvin is 6,000 feet. This depth capability would open to exploration about one-sixth of the ocean bottom and about one-half of the water volume of the oceans and neighboring seas, including the continental shelves, part of the continental and island slopes, and many sea mounts. The upper 6,000-foot marine layer includes much of the life of the oceans as well as the region where variables such as currents, temperatures, and sound velocities of interest to the oceanographer are most active.

Scientific Instrumentation: Five viewing ports are planned--1 looking directly for-

ward, 1 downward, 1 to each side, and 1 peep-hole directly upward through the hatch for use when surfacing. There is a planned provision for 1,200 pounds of scientific "payload" consisting of but not necessarily limited to the following: scanning sonar, echo-sounder, underwater telephone, lights, underwater television, mechanical arm, and a variety of cameras. Navigation equipment will include a gyrocompass, magnetic compass, speed indicator, and depth gauges.

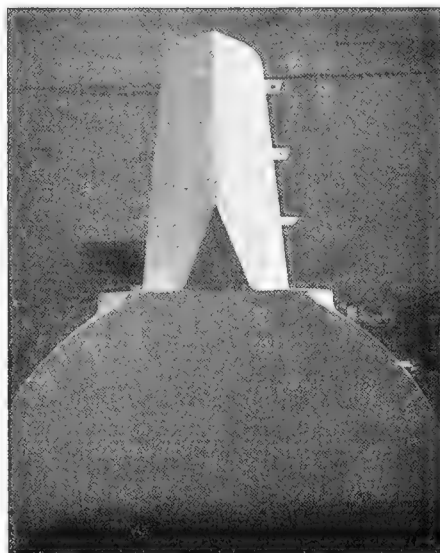


Fig. 3 - Aft view of conning tower section of Alvin.

Pressure Hull: The Alvin's pressure hull, which will house the crew and much of the scientific equipment, has been fabricated from high-grade steel with an inside diameter of 79.3 inches and a shell thickness of $1\frac{1}{2}$ inches. This all-important unit is constructed from twin hemispheres welded together. Its position is forward in the vehicle and by itself is positively buoyant. The remainder of the vehicle, enclosed in an outside skin of fiberglass, is open to the pressure of the sea. The fiberglass enclosure houses additional buoyancy sphere and plastic buoyancy material, plus the power supply and propulsion equipment. Whereas the pressure hull is strong enough to maintain atmospheric pressure by withstanding outside pressures, the fiberglass housing will avoid collapse by allowing inside pressure to equalize with outside pressure.

Propulsion: The Alvin will be propelled by battery-powered electric motors running in

oil and driving hydraulic pumps. It will have three propellers for locomotion and maneuvering. The main propulsion propeller in the stern is horizontally trainable plus or minus 50 degrees (by hydraulic ram) and will serve also as a rudder. Two smaller propellers are mounted forward near the pressure hull and can be turned 360 degrees in the vertical plane to provide fore and aft or up and down thrust. Generally, ascent and descent will be controlled by flooding and exhausting ballast tanks, similar to a conventional submarine, and by use of propeller thrust. In case of emergency, the buoyant pressure hull can be released from the rest of the vehicle, and, short of that, other heavy components, including the battery supply and the mechanical arm, can be manually-released to provide needed lift.

Life Support System: There will be approximately 170 cubic feet of space in the pressure sphere for breathing atmosphere. A system will be provided for supplementing the oxygen supply and removing the carbon dioxide and water vapor during the period of a maximum dive--24 hours.

Operations: The Alvin will be dependent upon a mothership or near-shore base for battery and air charging, life support chemicals, and other necessities. It is not planned to do much horizontal traveling on the surface; rather the Alvin would be carried to the scene of a dive by the mothership and lowered into the water. This mode of operation is one reason for Alvin's relatively small size.

Testing Schedule: Plans call for completion of the Alvin and delivery to Woods Hole in the spring of 1964. Some preliminary testing of the vehicle will be conducted before that time, including tests of the pressure hulls at the Southwest Research Institute, San Antonio, Texas. The scheduling of underwater tests will depend upon weather conditions prevailing when the Alvin is completed. (Woods Hole Oceanographic Institution, January 1964.)

Note: See Commercial Fisheries Review, May 1963 p. 36.

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NEW OCEANOGRAPHIC VESSEL FOR BIOLOGICAL RESEARCH FOUNDATION:

A new 97-foot oceanographic research vessel, the Neptunus Rex of the Beaudette Foundation for Biological Research at Santa Ynez, Calif., was designed and built in Norway ex-

pressly for oceanographic research. She is of a North Sea trawler design with a welded steel hull, and was launched in August 1962.



The new oceanographic research vessel, Neptunus Rex.

Specifications and other dimensions of the Neptunus Rex are: Beam: 21 feet, 6 inches; draft: 11 feet; displacement: 400 tons; tonnage: 170 gross, 112 net; propulsion: two 300-hp. Diesels; propeller: single 3-blade variable pitch; complement: crew of 7 and scientific staff of 6.

The main scientific working area of the vessel is at the forward well deck where the main winch and A-frame are located. The main winch is operated hydraulically and has interchangeable cable drums capable of using other drums with different types of cable.

Forward of the open working area, a 400-square-foot laboratory occupies the whale-back of the vessel and has both 110 and 220 volt a.c. available. Meteorological equipment includes barometer, barograph, anemometer, and psychrometer. A bathythermograph winch is mounted on the after boat deck. The bathythermograph has specially designed fins permitting it to dive to a depth of 400 meters (1,312 feet) while it traces a record of the temperature and depth of the water on a graphic slide.

The vessel started on her first expedition in April 1963 when she went to Bahia de Los Angeles, Gulf of California, and made a second visit in October 1963 to the east coast of Baja, Calif. (National Oceanographic Data Center Newsletter, December 31, 1963.)

* * * * *

PUERTO RICO NUCLEAR CENTER MARINE BIOLOGY PROGRAM:

The Puerto Rico Nuclear Center of the University of Puerto Rico is conducting a marine biology program designed to measure biological productivity and the movements of

selected trace elements in the hydrosphere and biosphere of a tropical marine environment which extends seaward from the mouth of a river transporting large quantities of silt. Primarily, the work is concerned with the distributions of trace elements and is based upon the concept that a knowledge of the geochemical routes of the stable elements may be used to predict the fates of corresponding radioelements.

The investigations of productivity and trace element metabolism are being done with carrier-free or high specific activity radioisotopes in controlled environments. The trace element analyses are being done by neutron activation analysis, atomic absorption, flame spectrophotometry, and X-ray emission spectrography. The oceanographic measurements are made with standard equipment.

The geographical area of investigation includes the Afidsco River watershed (covering 200 square miles) and the adjoining marine area of the west coast of Puerto Rico extending north from Mayaquez past Punta Higuero to the mouth of the Culebrinas River and west into the Mona Pass to Desocheo Island. The area includes the reactor site at Punta Higuero.

All phases of the work were in progress in January 1964. (Puerto Rico Nuclear Center, University of Puerto Rico, College Station, Mayaquez, Puerto Rico.)

* * * * *

MARINE BIOACOUSTIC RESEARCH MAY AID COMMERCIAL FISHERIES:

Fish and other marine organisms "talk" to each other, according to a scientist who predicts that knowledge of the sounds made by them will be used to track and locate schools of commercially-valuable fish. This is the conviction of the Director of the world's largest underwater bioacoustic library at the University of Rhode Island Graduate School of Oceanography after more than 17 years of continuous research.

Noting that the U. S. Navy had already developed listening devices for tracking enemy submarines, the acoustic biologist suggested that a series of fixed, unmanned, underwater listening posts be established. Underwater sounds could then be intercepted and rebroadcast to cruising fishermen. The scientist

also believes that it may be possible to attract fish by broadcasting underwater man-made sounds. Sounds that frighten some marine creatures have already been developed. They might prove beneficial in herding fish or containing them in a chosen area.

Also noting that the noises produced by underwater creatures are usually associated with "colony life," the scientist said that if one fish of a school is captured, a characteristic sound is produced by certain species, and the entire group flees. Underwater biological noises are also associated with such activities as breeding and competitive feeding. In addition, it was explained that certain nocturnal fish have well-developed sound-producing systems.

After a thorough study of the sounds made by white whales held in captivity, the scientist and an associate at the University of Rhode Island, said in the Sears Foundation's Journal of Marine Research that their work "confirms previous evidence of a wide repertoire of recognizably different types of sound that, used singly or in combination, have specific meaning."

Working under the oldest continuous biological contract with the Office of Naval Research, the Director of the bioacoustic library accumulates hundreds of miles of audio tape each year. When a new sound is discovered and thoroughly analyzed, it becomes part of the "Reference File of Biological Sounds," maintained since 1954 at the request of the U. S. Navy. Although this contains sounds recorded from researchers all over the world, an estimated 98 percent of the material was developed by the library's director and associates.

To date, about 400 of the sound-producing organisms in the Western North Atlantic have been auditioned by the scientist, ranging from shrimp and crab to porpoise, whales, sea lions, sea cows, and other sorts of fish. Every marine animal, it was discovered, has a characteristic sound "signature." (Source: University of Rhode Island--reprinted from National Oceanographic Data Center Newsletter, December 31, 1963.)

Note: See Commercial Fisheries Review, July 1963 p. 27.



Pollution

ANTIPOLLUTION DAM WILL IMPROVE FISH RUNS IN SACRAMENTO RIVER:

Migratory steelhead and salmon in California's Sacramento River will have a better chance of surviving as a result of the apparently successful operation of the Spring Creek Debris Dam. Built by the Bureau of Reclamation, U. S. Department of the Interior, to protect valuable commercial and sport fish spawning grounds, the new dam traps silt and chemical laden water, then slowly releases it in amounts below levels potentially toxic to fish in the Sacramento River.

Spring Creek flows into the Sacramento above Keswick Dam, carrying water which drains the historic mining areas near Redding. The water spilling from the watershed brings minute particles and soluble forms of copper, arsenic, lead, zinc, and other chemicals. By storing large quantities of runoff, then releasing the potentially toxic water in small quantities, the new antipollution dam protects spawning areas below Keswick Dam. Before construction of the dam, large numbers of fish were periodically destroyed by the polluted water from Spring Creek.

An Assistant Secretary of the U. S. Department of the Interior noted that the Spring Creek Dam marked a major milestone in the development of answers to problems of water pollution management. The dam facilitates nearby power production, provides flood control, and--most critically--handles the carefully controlled discharge of potentially dangerous polluted water. The primary effect of the dam is to preserve and protect valuable salmon and steelhead resources. "It is an interesting footnote to the reported success of the dam," the Assistant Secretary said, "that this dam is, in reality, one of the prices we are paying in the 1960's for the development of northern California's rich mineral deposits a century ago. Its success, however, strengthens the determination of Federal and state water planners and officials to put the full weight of modern scientific technology into solving the complex problems of water throughout the Nation."

The Spring Creek Dam reservoir provides storage space for some 2,000 acre-feet of sediment--enough to last an estimated 50 years. The dam was completed in the summer of 1963 and with heavy rains in September, it received its first crucial test. A

large storm in November filled the reservoir to more than half its holding capacity. Regulated releases began November 8 and continued through the first week in January. As the Spring Creek water was mixed with Sacramento River water and with water from the Trinity River, it was diluted to the point of being safe to fish in the lower river. In late 1963 and early 1964, there was an estimated runoff of 6,000 acre-feet of polluted water from the old mining areas, however, there were no reports of damage to salmon or steelhead in the Sacramento River.

Before construction of Shasta Dam, the heaviest runoff of polluted water coincided with flood flows from the Upper Sacramento, and the toxic compounds were diluted before they could do serious damage. But since 1944, Shasta Dam has controlled flooding on the Upper Sacramento and the polluted water from Spring Creek had been entering Keswick Reservoir at times when releases from Shasta were low.



Quality

GUIDELINES FOR TROLL SALMON VESSELS:

The continuing interest of fishermen in landed fish quality was demonstrated at a meeting held in early 1964 by the Seattle (Wash.) Technological Laboratory of the U. S. Bureau of Commercial Fisheries. The meeting was mainly concerned with a review of quality improvement guidelines for Pacific troll salmon ice vessels. Fishermen's representatives discussed the quality problems encountered during the 1963 troll salmon season, including handling of catch, icing, physical damage, and sanitation of vessels. It was agreed that those are still the most important factors to be stressed, and that the use of preservative ices or refrigerated sea water in the troll fishery have not been decisive factors in landed fish quality. The Seattle laboratory will cooperate further with fishermen in providing additional recommendations for use of sanitizing agents and suggestions for educational material on icing time and temperature in relation to fish quality and bacterial spoilage.

* * * * *

NEW YORK STATE ACCEPTS USDI INSPECTION FOR FISH:

All fresh and frozen fish fillets purchased for New York State Institutions after June 1, 1964, will be inspected by U. S. Department of the Interior (USDI) Inspection Service. At that time, the New York State fishery inspection service will be disbanded.

The use of National Association of State Purchase Officials (NASPO) specifications has also been considered by New York, but will be deferred until NASPO specifications exist for all fishery products used by the State.



Salmon

ATLANTIC RESTORATION STUDIES:

Experimental studies aimed at improving fish-cultural methods for Atlantic salmon will be carried out by the U. S. Bureau of Sport Fisheries and Wildlife. The experimental procedure will be designed by the Bureau's Maine Cooperative Fishery Unit, located at the University of Maine, in cooperation with all agencies concerned. Experiments will be conducted at the Craig Brook National Fish Hatchery. The objective of the program is to provide information that will enable fish culturists to produce hatchery-reared salmon with physiological characteristics approaching those of the wild fish, in predictable numbers, and at the proper time for stocking.

The salmon restoration programs of Maine's Sea-Run Commission require a dependable supply of one-year-old smolts for stocking purposes. In the past, experimental alterations in fish cultural practices have not succeeded in providing a dependable supply. Large and frequently unexplained mortalities of hatchery-reared fish have occurred in all stages of development.

* * * * *

MASSIVE PROGRAM TO INTRODUCE FALL CHINOOK SALMON RUN IN UPPER WILLAMETTE RIVER:

Plans for the construction of new fish passage facilities at Willamette Falls at Oregon City, Ore., were almost completed in early 1964. The new facilities will make it possible for fall chinook salmon to reach the upper

Willamette River to spawn. (The upper river already has steelhead, coho salmon, and spring chinook salmon.) In conjunction with the new fishway, approximately 7½ million young fall chinook are being released in the upper river in the vicinity of Eugene, Corvallis, and Harrisburg, Ore. Some fish were also being released in the lower areas of major tributary streams above the falls. Planting began in mid-February and will continue through April or May 1964.



Chinook Salmon

The young fall chinook salmon needed to stock the Willamette River were raised in the Eagle Creek National Fish Hatchery operated by the U. S. Bureau of Sport Fisheries and Wildlife, and in the Skamania Hatchery operated by Washington State. Surveys conducted by the Fish Commission of Oregon show that the Willamette River above the falls contains many spawning and rearing areas satisfactory for fall chinook salmon. Officials of the U. S. Fish and Wildlife Service said the joint effort of Federal and State agencies on the Willamette River is indicative of the cooperation which has prevailed throughout the program of salmon rehabilitation which began in 1949. (Northwest Regional Information Office, U. S. Department of the Interior, February 11, 1964.)



Shrimp

NEW CONTRACTS OPENED FOR FUTURES TRADING IN FROZEN SHRIMP AT CHICAGO:

Rules and specifications applicable to futures trading in frozen shrimp (No. 1 Contract) for delivery in September and November 1964, and January 1965, as issued early this year by the Chicago Mercantile Exchange, Chicago, Ill., are as shown on page 31.

Following issuance of the rules and specifications on page 31, the Board of Governors of the Chicago Mercantile Exchange, at a meeting held on February 6, 1964, voted to open new contracts for small-

CLASSIFICATION AND GRADE: All futures contracts for Frozen Shrimp shall be U. S. Grade "A" raw, frozen, grooved, headless with a count of 15/20 to the pound and shall be restricted to the catch of domestic boats leaving from and returning to domestic ports. All shrimp must meet the requirements of standards as promulgated by the U. S. Department of Interior, Fish and Wildlife Service.

TRADING UNIT ON FUTURES CALL: All transactions cleared through the Clearing House shall be in units of 5,000 pounds.

FUTURES PRICE FLUCTUATIONS AND LIMITS: The minimum price fluctuation in the futures market will be 1/10¢ per pound, equivalent of \$5.00 per contract. A full cent price change equals \$50.00 per contract.

Daily fluctuations are limited to 4¢ (400 points) per pound, upward or downward from the previous day's settling price.

DELIVERIES AND SUBSTITUTIONS ON THE FUTURES CALL: To qualify for delivery Frozen Shrimp shall be tendered for delivery in accordance with requirements of the Exchange rules and with specifications announced by the Board of Governors prior to the opening of the contract. The weight of a delivery unit shall be 5,000 pounds and the grade thereof shall comply with the contract of sale subject to such substitutions as are allowed.

A delivery unit of 5,000 pounds shall consist of 100 master cartons, each master carton containing ten 5-pound packages. The unit shall consist of not more than 3 lots or sub-lots with no lot or sub-lot weighing less than 1,000 pounds. The entire unit must be processed by one packer and must be stored during any one calendar month. Each delivery unit must be uniform as to species.

Frozen Shrimp which have been in storage more than eight months are not deliverable except that a delivery unit delivered in accordance with the rules during a delivery month is eligible for re-delivery through that month.

Allowable variations in quantity of a delivery unit are as follows: Minimum delivery unit: 4,750 pounds—95 master cartons of 50 pounds each. Maximum delivery unit: 5,250 pounds—105 master cartons of 50 pounds each. A weight tolerance of 3% shall be permitted. Payment shall be made on the basis of the exact quantity delivered.

All shrimp delivered on Exchange contracts shall be of good pack, glazed and packed in paperboard cartons which

must meet all Federal regulations governing labeling and packing.

All shrimp shall conform in every respect to the provision of the Federal Food, Drug and Cosmetic Act together with all regulations promulgated thereunder.

Inspection certificates must be in good standing up to 5:00 P.M. on the business day following day of tender.

Par delivery shall be frozen shrimp in approved cold storage warehouses in the Dallas-Fort Worth, Texas, area. Delivery in other approved cold storage warehouses in the eight states of Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, North Carolina, and South Carolina may be made at 1¢ a pound discount.

Brown, white, and pink Shrimp are deliverable at par but each delivery unit must be uniform.

PERMISSIBLE SUBSTITUTIONS: Frozen shrimp with a count of less than 15 to the pound shall be deliverable at par. Frozen shrimp with a count of 21/25 to the pound shall be deliverable with an allowance of 7¢ a pound. Grade B shrimp meeting all other requirements are deliverable at 4¢ a pound allowance. Each delivery unit must be uniform as to count per pound.

INSPECTION CERTIFICATES: Inspections will be made for members only and in the order of applications filed except precedence shall be given to inspections relating to transactions made on Exchange.

An official inspection certificate shall be final. No re-inspection upon the same application shall be permitted.

No member shall order an official inspection on another member's goods without the written order of such member.

An official inspection certificate on Frozen Shrimp issued by the Exchange shall state the location and the grade established. It shall bear the signature of the President or Assistant to the President and the seal of the Exchange. It shall state the date of inspection and the time when the certificate expires. This certificate shall be based upon an inspection certificate of the United States government and such government certificate (or a copy thereof) shall in all cases accompany the Exchange certificate.

The removal of the commodity from the place or location designated on the inspection certificate invalidates the certificate.

The charge for inspection shall be the cost plus 50¢ per lot for Exchange certificate.

LIFE OF INSPECTION CERTIFICATE. An Exchange inspection certificate for quality or weights of frozen shrimp in cold

storage shall expire on the first business day of the sixth month following date of inspection provided the shrimp have remained in the same warehouse and have been kept under proper refrigeration in the meantime.

STORAGE CHARGES ON FUTURES CALL TO BE ON A PRO RATA BASIS: On all deliveries made on the Futures call the seller must assume storage up to 5 P.M. on the second business day after the date of delivery. The proration shall be on the basis of 1/30th of the prevailing monthly storage rate at the particular warehouse raised to the nearest 5¢ and multiplied by the number of days remaining to the next storage expiration date (all months figured on the basis of 30 days). In no case shall handling charges be included in such proration. The storage charges shall be paid in advance by the person holding shrimp on the storage expiration date and pro rata charges prepaid by such holder shall be added to and shown on the tender notice.

SPECULATIVE POSITION LIMITS. No member for himself or for a customer, and no firm for its own account or for the account of a customer, may carry, control, or have a proprietary interest in more than a total of 200 Frozen Shrimp contracts with a maximum of 200 in any one contract month, nor shall any individual, customer, or firm exceed the above limits in any single day's trading.


TRADING HOURS. From 9:25 A.M. to 12:45 P.M.

COMMISSION CHARGES. The uniform minimum fee for the purchase, sale, or purchase and sale of a shrimp futures contract is \$18.00 per unit.

WAREHOUSES APPROVED FOR SHRIMP DELIVERIES:


- Allord Refrigerated Warehouses, Inc.—260, McBride Lane, Corpus Christi, Tex.
- Alford Refrigerated Warehouses, Inc.—318 Cadiz Street, Dallas, Tex.
- Houston Terminal Warehouse & Cold Storage Co.—Houston, Texas
- Ingram Freezers—Dallas, Texas
- Merchants Cold Storage Co.—Fort Worth, Texas
- New Orleans Cold Storage & Warehouse Co. Ltd.—124 Airline Highway, Metairie, La.
- Texas Ice and Refrigerating Co.—Fort Worth, Texas
- U. S. Cold Storage Corp.—Fort Worth, Texas

er size shrimp (used for bread-ing, soups, etc.) The new contract known as No. 2 Contract with delivery months of October and December 1964, and February 1965, were listed for trading on the Chicago Mercantile Exchange on February 17, 1964. The No. 2 Contract listing rules and specifications on futures trading in smaller sizes of frozen shrimp, as announced and issued by the Chicago Mercantile Exchange follow:



No. 2 Contract

FROZEN SHRIMP



CHICAGO MERCANTILE EXCHANGE

110 N. FRANKLIN STREET • CHICAGO 6, ILLINOIS

CLASSIFICATION AND GRADE: All futures contracts for Frozen Shrimp shall be U. S. Grade "A" raw, frozen, headless with a count of 31/35 to the pound and shall be restricted to the catch of domestic boats leaving from and returning to domestic ports. All shrimp must meet the requirements of standards as promulgated by the U. S. Department of Interior, Fish and Wildlife Service.

TRADING UNIT ON FUTURES CALL: All transactions cleared through the Clearing House shall be in units of 5,000 pounds.

FUTURES PRICE FLUCTUATIONS AND LIMITS: The minimum price fluctuation in the futures market will be 1/10¢ per pound, equivalent of \$5.00 per contract. A full cent price change equals \$50.00 per contract.

Daily fluctuations are limited to 4¢ (400 points) per pound, upward or downward from the previous day's settling price.

DELIVERIES AND SUBSTITUTIONS ON THE FUTURES CALL: To qualify for delivery Frozen Shrimp shall be tendered for delivery in accordance with requirements of the Exchange rules and with specifications announced by the Board of Governors prior to the opening of the contract. The weight of a delivery unit shall be 5,000 pounds and the grade thereof shall comply with the contract of sale subject to such substitutions as are allowed.

A delivery unit of 5,000 pounds shall consist of 100 master cartons, each master carton containing ten 5-pound packages. The unit shall consist of not more than 3 lots or sub-lots with no lot or sub-lot weighing less than 1,000 pounds. The entire unit must be processed by one packer and must be stored during any one calendar month. Each delivery unit must be uniform as to species.

Frozen Shrimp which have been in storage more than eight months are not deliverable except that a delivery unit delivered in accordance with the rules during a delivery month is eligible for re-delivery through that month.

Allowable variations in quantity of a delivery unit are as follows: Minimum delivery unit: 4,750 pounds—95 master

cartons of 50 pounds each. Maximum delivery unit: 5,250 pounds—105 master cartons of 50 pounds each. A weight tolerance of 3% shall be permitted. Payment shall be made on the basis of the exact quantity delivered.

All shrimp delivered on Exchange contracts shall be of good pack, glazed and packed in paperboard cartons which must meet all Federal regulations governing labeling and packing.

All shrimp shall conform in every respect to the provision of the Federal Food, Drug and Cosmetic Act together with all regulations promulgated thereunder.

Inspection certificates must be in good standing up to 5:00 P.M. on the business day following day of tender.

Par delivery shall be frozen shrimp in approved cold storage warehouses in the Dallas-Fort Worth, Texas, area. Delivery in other approved cold storage warehouses in the eight states of Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, North Carolina, and South Carolina may be made at 1¢ a pound discount.

Brown, white, and pink Shrimp are deliverable at par but each delivery unit must be uniform.

PERMISSIBLE SUBSTITUTIONS: Frozen shrimp with a count of 36/42 to the pound and meeting all other requirements of these rules shall be deliverable at 5¢ a pound allowance. Frozen shrimp with a count of 43/50 to the pound and meeting all other requirements of these rules shall be de-

liverable at 10¢ a pound allowance, and Frozen Shrimp with a count of 51/60 shall be deliverable at 15¢ a pound allowance. Grade B shrimp meeting all other requirements of these rules shall be deliverable at 4¢ a pound allowance. Each delivery unit must be uniform as to count per pound.

INSPECTION CERTIFICATES: Inspections will be made for members only and in the order of applications filed except precedence shall be given to inspections relating to transactions made on Exchange.

An official inspection certificate shall be final. No re-inspection upon the same application shall be permitted.

No member shall order an official inspection on another member's goods without the written order of such member.

An official inspection certificate on Frozen Shrimp issued by the Exchange shall state the location and the grade established. It shall bear the signature of the President or Assistant to the President and the seal of the Exchange. It shall state the date of inspection and the time when the certificate expires. This certificate shall be based upon an inspection certificate of the United States government and such government certificate (or a copy thereof) shall in all cases accompany the Exchange certificate.

The removal of the commodity from the place or location designated on the inspection certificate invalidates the certificate.

The charge for inspection shall be the cost plus 50¢ per lot for Exchange certificate.

LIFE OF INSPECTION CERTIFICATE: An Exchange inspection certificate for quality or weights of frozen shrimp in cold storage shall expire on the first business day of the sixth month following date of inspection provided the shrimp have remained in the same warehouse and have been kept under proper refrigeration in the meantime.

STORAGE CHARGES ON FUTURES CALL TO BE ON A PRO RATA BASIS: On all deliveries made on the futures call the seller must assume delivery up to 5 P.M. on the second business day after the date of delivery. The proration shall be on the basis of 1/30th of the prevailing monthly storage rate at the particular warehouse raised to the nearest 5¢ and multiplied by the number of days remaining to the next storage expiration date (all months figured on the basis of 30 days). In no case shall handling charges be included in such proration. The storage charges shall be paid in advance by the person holding shrimp on the storage expiration date and pro rata charges prepaid by such holder shall be added to and shown on the tender notice.

SPECULATIVE POSITION LIMITS: No member for himself or for a customer, and no firm for its own account or for the account of a customer, may carry, control, or have a proprietary interest in more than a total of 200 Frozen Shrimp contracts with a maximum of 200 in any one contract month, nor shall any individual, customer, or firm exceed the above limits in any single day's trading.

Note: See Commercial Fisheries Review, December 1963 p. 42.

UNITED STATES SHRIMP SUPPLY INDICATORS, JANUARY 1964:

| Item and Period | 1964 | 1963 | 1962 | 1961 | 1960 |
|---|-------|----------|---------|---------|---------|
| (1,000 Lbs., Heads-Off) | | | | | |
| Total landings, So. Atl. and Gulf States: | | | | | |
| March | - | 3,632 | 3,331 | 4,754 | 4,099 |
| February | - | 3,986 | 4,123 | 3,910 | 3,784 |
| January | 5,600 | 3,993 | 3,840 | 5,686 | 5,402 |
| December | - | 9,500 | 8,615 | 6,538 | 7,099 |
| November | - | 13,212 | 12,177 | 9,996 | 14,454 |
| January-December | - | 138,700 | 105,839 | 91,396 | 141,035 |
| Quantity canned, Gulf States 1/: | | | | | |
| March | - | 92 | 86 | 35 | 117 |
| February | - | 281 | 241 | 90 | 204 |
| January | 230 | 592 | 492 | 183 | 266 |
| December | - | 2,175 | 1,879 | 816 | 894 |
| November | - | 2,495 | 2,727 | 2,175 | 1,535 |
| January-December | - | 29,468 | 23,322 | 14,500 | 26,394 |
| Frozen inventories (as of end of each mo.) 2/: | | | | | |
| March 31 | - | 27,970 | 16,607 | 31,345 | 23,232 |
| February 28 | - | 28,039 | 19,012 | 37,612 | 29,063 |
| January 31 | - | 28,487 | 21,328 | 37,842 | 34,332 |
| December 31 | - | 3/45,764 | 31,577 | 19,755 | 40,913 |
| November 30 | - | 3/42,142 | 27,500 | 20,668 | 37,264 |
| October 31 | - | 3/37,418 | 21,315 | 17,811 | 31,209 |
| Imports 4/: | | | | | |
| March | - | 13,616 | 9,658 | 10,347 | 8,545 |
| February | - | 12,100 | 10,599 | 8,932 | 7,657 |
| January | - | 13,139 | 12,907 | 12,338 | 8,596 |
| December | - | 16,296 | 15,798 | 15,442 | 12,411 |
| November | - | 14,759 | 17,964 | 14,852 | 13,516 |
| January-December | - | 151,530 | 141,183 | 126,268 | 113,418 |
| (c/lb., 26-30 Count, Heads-Off) | | | | | |
| Ex-vessel price, all species, So. Atl. & Gulf Ports: | | | | | |
| March | - | 85.5 | 80.9 | 56.0 | 56.3 |
| February | - | 85.7 | 78.9 | 53.5 | 51.8 |
| January | 60-69 | 85.0 | 76.3 | 52.5 | 49.5 |
| December | - | 5/54-65 | 82.9 | 75.2 | 54.2 |
| November | - | 5/52-62 | 84.5 | 73.5 | 54.0 |
| October | - | 5/51-64 | 90.0 | 68.7 | 53.0 |
| September | - | 5/55-64 | 90.9 | 70.1 | 52.2 |
| August | - | 59.0 | 83.6 | 66.1 | 52.0 |
| Wholesale price froz. brown (5-lb. pkg.) Chicago, Ill.: | | | | | |
| March | - | 102-106 | 94-95 | 69-71 | 65-68 |
| February | - | 102-106 | 93-95 | 69-71 | 65-67 |
| January | 78-83 | 102-106 | 91-94 | 69-71 | 64-66 |
| December | - | 75-82 | 101-107 | 91-92 | 68-70 |
| November | - | 71-78 | 105-110 | 89-92 | 69-73 |

(Table continued on next column.)

| Item and Period | 1964 | 1963 | 1962 | 1961 | 1960 |
|--|------|-------|---------|-------|-------|
| (1,000 Lbs., Heads-Off) | | | | | |
| October | - | 67-75 | 108-115 | 83-90 | 69-73 |
| September | - | 73-77 | 113-118 | 87-90 | 65-70 |
| August | - | 75-81 | 110-112 | 76-91 | 64-67 |
| 1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. The figures in the section (Quantity canned, Gulf States) have been completely revised beginning with February 1963 on the basis of a new conversion factor (formerly 33.0 pounds per case). | | | | | |
| 2/Raw headless only; excludes breaded, peeled and deveined, etc. | | | | | |
| 3/Inventory of October 31, 1963, includes 1,203,000 pounds; November 30, 1963, includes 1,189,000 pounds; and December 31, 1963, includes 1,256,000 pounds for firms not reporting previously. | | | | | |
| 4/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census. | | | | | |
| 5/Range in prices at Tampa, Fla.; Morgan City, La.; area; Port Isabel and Brownsville, Texas, only. | | | | | |
| Note: January 1964 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68. | | | | | |



Tuna

FISHING BASE IN PALAU ISLANDS PLANNED BY CALIFORNIA FIRM:

A California tuna-packing firm has plans under way to establish a tuna-fishing base in the Palau Islands (U. S. Trust Territory of the Pacific Islands in the Pacific Ocean east of the Philippines). Two representatives of the United States tuna cannery were in Koror, Palau, in February 1964 when they met with officials of a local construction company to discuss construction bid plans.

One of the first construction items discussed was housing quarters needed by the middle of May for some 120 fishermen. Other facilities for the proposed base to be built or installed on Malakai Island include a 1,200-ton fish-storage freezer, ice-making machines, water-storage tanks, and office space. Bid negotiations for actual construction of the plant are to begin in mid-May and it is planned to have the plant in operation by July 1, 1964.

Plans call for six 25-gross-ton tuna vessels to begin operating from Koror's main port with 72 Okinawans and 48 Palauans as crewmen and fishermen, according to an Economic Development Officer of the Trust Territory. Under the provisions of the contract signed by the Trust Territory and the California firm's officials, the Palauans will be trained as tuna fishermen and eventually the tuna-fishing vessels will be manned completely by them.

The Trust Territory Officer said that expansion of tuna fishing in other parts of the Territory will depend to a great degree on the success of the initial program in Palau. (Press release, Trust Territory of the Pacific Islands, Saipan, February 17, 1964.)



United States Fisheries

COMMERCIAL FISHERY LANDINGS, 1963:

Total Landings: Fish and shellfish landings in the United States in 1963 were down 11.5 percent as compared with 1962. Landings were about 600 million pounds less than in 1962--due mainly to reduced catches of menhaden, salmon, whiting, and ocean perch.

Menhaden: Landings in 1963 totaled about 1.7 billion pounds--524 million pounds less than during 1962. Production was down in every state except in North Carolina where the catch of 190 million pounds was 67 million pounds more than in the previous year. The North Carolina increase resulted from a productive fishery in the last two months of the year.

Salmon: On the basis of the reported pack of canned salmon, it is estimated that the 1963 catch in Alaska was approximately 214 million pounds--about 60 million pounds less than in 1962.

Shrimp: There was a significant gain in landings of South Atlantic and Gulf shrimp during 1963 due to sharply increased landings in the Gulf States. Production in the South Atlantic and Gulf areas totaled 220 million pounds--an increase of 52 million pounds or 31 percent.

Tuna: Landings (including bonito) in California amounted to about 315 million pounds--

| United States Commercial Fishery Landings of Certain Species, 1962-63 | | |
|---|-------------------------------|------------------|
| Species | 1/1963 | 1962 |
| Anchovies, Calif. | ... (1,000 Lbs.) ... 3,300 | 2,764 |
| Cod, Atlantic: | | |
| Maine | 2,000 | 2,260 |
| Mass. | 33,600 | 40,647 |
| Other | 3,600 | 4,003 |
| Total cod | 39,200 | 46,910 |
| Crabs: | | |
| Dungeness, Alaska | 11,800 | 8,990 |
| King, Alaska | 77,000 | 52,782 |
| Haddock: | | |
| Maine | 2,800 | 2,545 |
| Mass. | 119,600 | 131,558 |
| Other | 200 | 147 |
| Total haddock | 122,600 | 134,250 |
| Halibut: 2/ | | |
| Alaska | 22,400 | 27,682 |
| Wash., Oreg., and Calif. | 11,800 | 12,657 |
| Total halibut | 34,200 | 40,339 |
| Herring: | | |
| Maine | 147,000 | 156,699 |
| Alaska | 31,000 | 33,876 |
| Industrial Fish, Maine and Mass. 3/ ... | 47,900 | 31,680 |
| Mackerel: | | |
| Jack, Calif. | 97,500 | 89,979 |
| Pacific | 37,300 | 48,579 |
| Menhaden | 1,726,000 | 2,249,917 |
| Ocean perch, Atl. | 108,200 | 123,983 |
| Pollock | 14,300 | 16,333 |
| Salmon | 280,000 | 314,566 |
| Sardine, Pacific | 6,000 | 15,363 |
| Scallops, sea, New Bedford (meats) ... | 19,200 | 24,634 |
| Shrimp (heads-on): | | |
| So. Atl. and Gulf | 220,300 | 167,804 |
| Other | 18,700 | 23,302 |
| Total shrimp | 239,000 | 191,106 |
| Tuna | 315,000 | 312,157 |
| Whiting: | | |
| Maine | 15,900 | 17,832 |
| Mass. | 55,300 | 75,384 |
| Other | 9,600 | 11,872 |
| Total whiting | 80,800 | 105,088 |
| Total all above items | 3,437,300 | 3,999,995 |
| Other 4/ | 1,212,700 | 1,256,163 |
| Grand total | 4,650,000 | 5,256,158 |

1/Preliminary.
2/Dressed weight.
3/Excludes menhaden.
4/Includes landings for species not listed.
Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.

1 percent more than in 1962. Atlantic Coast landings amounted to 12 million pounds as compared with 7.2 million pounds the previous year.

Mackerel: Pacific mackerel landings in 1963 amounted to 37 million pounds--down 11 million pounds as compared with 1962.

Landings of jack mackerel (97 million pounds) increased about 7.5 million pounds.

**FISH STICKS AND PORTIONS,
OCTOBER-DECEMBER 1963:**

United States production of fish sticks and fish portions amounted to 45.3 million pounds during the fourth quarter of 1963, according to preliminary data. Compared with the same quarter of 1962, this was a gain of 3.0 million pounds or 7 percent. Fish sticks (20.2 million pounds) were up 1.2 million pounds or 6 percent, while fish portions (25.1 million pounds) were up 1.8 million pounds or 8 percent.

Cooked fish sticks (18.5 million pounds) made up 92 percent of the October-December 1963 fish stick total. There

Table 1 - U.S. Production of Fish Sticks by Months and Type, October-December 1963 1/

| Month | Cooked | | | Raw | | | Total | | |
|-------------------------------------|------------------------|--------------|---------------|-----|--|--|-------|--|--|
| | (1,000 Lbs.) ... | | | | | | | | |
| October | 7,201 | 882 | 8,083 | | | | | | |
| November | 5,790 | 394 | 6,184 | | | | | | |
| December | 5,526 | 429 | 5,955 | | | | | | |
| Total 4th Qtr. 1963 1/ | 18,517 | 1,705 | 20,222 | | | | | | |
| Total 4th Qtr. 1962 | 17,563 | 1,467 | 19,030 | | | | | | |
| Total 1963 1/ | 73,898 | 4,932 | 78,830 | | | | | | |
| Total 1962 | 66,801 | 5,416 | 72,217 | | | | | | |

1/Preliminary.

Table 2 - U. S. Production of Fish Sticks by Areas, October-December 1963 and 1962

| Area | 1/1963 | | 2/1962 | |
|---------------------------|--------------|---------------|--------------|---------------|
| | No. of Firms | 1,000 Lbs. | No. of Firms | 1,000 Lbs. |
| Atlantic Coast States ... | 20 | 16,742 | 23 | 14,989 |
| Inland & Gulf States ... | 7 | 1,977 | 5 | 2,368 |
| Pacific Coast States ... | 9 | 1,503 | 10 | 1,673 |
| Total | 36 | 20,222 | 38 | 19,030 |

1/Preliminary.
2/Revised.

Table 3 - U.S. Production of Fish Sticks by Months, 1959-1963

| Month | (1,000 Lbs.) | | | | |
|--------------------|--------------------------|---------------|---------------|---------------|---------------|
| | 1/1963 | 2/1962 | 1961 | 1960 | 1959 |
| January | 7,554 | 6,082 | 6,091 | 5,511 | 6,277 |
| February | 8,241 | 6,886 | 7,097 | 6,542 | 6,352 |
| March | 8,053 | 7,658 | 7,233 | 7,844 | 5,604 |
| April | 6,546 | 5,719 | 5,599 | 4,871 | 4,717 |
| May | 5,750 | 5,643 | 5,129 | 3,707 | 4,407 |
| June | 6,125 | 5,117 | 4,928 | 4,369 | 4,583 |
| July | 4,836 | 3,740 | 3,575 | 3,691 | 3,790 |
| August | 5,674 | 5,760 | 6,927 | 5,013 | 3,879 |
| September | 5,829 | 6,582 | 5,206 | 5,424 | 5,353 |
| October | 8,083 | 6,698 | 6,133 | 6,560 | 5,842 |
| November | 6,184 | 6,305 | 6,288 | 6,281 | 4,831 |
| December | 5,955 | 6,027 | 5,618 | 5,329 | 4,743 |
| Total | 78,830 | 72,217 | 69,824 | 65,142 | 60,378 |

1/Preliminary.
2/Revised.

were 24.3 million pounds of breaded fish portions produced, of which 19.8 million pounds were raw. Unbreaded fish portions amounted to 796,000 pounds.

The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 16.7 and 14.0 million pounds, respectively. The Inland and Gulf States ranked second with 2.0 million pounds of fish sticks and 10.3 million pounds of fish portions. The remaining 2.3 million pounds of fish sticks and fish portions were produced by firms in the Pacific States.

Table 4 - U.S. Production of Fish Portions by Months and Type, October-December 1963 1/

| Month | Breaded | | | Un-breaded | | Total |
|------------------------------------|---------------|---------------|---------------|--------------|--|---------------|
| | Cooked | Raw | Total | | | |
| (1,000 Lbs.) | | | | | | |
| October | 2,010 | 7,510 | 9,520 | 311 | | 9,831 |
| November | 1,283 | 6,295 | 7,578 | 278 | | 7,856 |
| December | 1,137 | 6,030 | 7,167 | 207 | | 7,374 |
| Tot. 4th Qtr. 1963 1/ | 4,430 | 19,835 | 24,265 | 796 | | 25,061 |
| Tot. 4th. Qtr. 1962 | 4,132 | 18,337 | 22,469 | 827 | | 23,296 |
| Tot. 1963 1/ | 16,482 | 74,738 | 91,220 | 3,025 | | 94,245 |
| Total 1962 | 14,007 | 62,290 | 76,297 | 2,381 | | 78,678 |

1/Preliminary.

Table 5 - U. S. Production of Fish Portions by Areas, October-December 1963 and 1962

| Area | 1/1963 | | 2/1962 | |
|----------------------------|--------------|---------------|--------------|---------------|
| | No. of Firms | 1,000 Lbs. | No. of Firms | 1,000 Lbs. |
| Atlantic Coast States | 22 | 14,025 | 23 | 13,833 |
| Inland & Gulf States | 10 | 10,310 | 11 | 8,775 |
| Pacific Coast States | 8 | 726 | 7 | 688 |
| Total | 40 | 25,061 | 41 | 23,296 |

1/Preliminary.
2/Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1959-1963

| Month | (1,000 Lbs.) | | | | |
|--------------------|--------------------------|---------------|---------------|---------------|---------------|
| | 1/1963 | 2/1962 | 1961 | 1960 | 1959 |
| January | 8,173 | 5,077 | 4,303 | 3,632 | 2,692 |
| February | 7,361 | 6,360 | 4,902 | 3,502 | 3,025 |
| March | 8,835 | 7,036 | 5,831 | 4,706 | 3,225 |
| April | 7,919 | 6,408 | 4,484 | 3,492 | 2,634 |
| May | 7,293 | 5,818 | 3,879 | 3,253 | 2,684 |
| June | 8,774 | 6,137 | 4,039 | 3,995 | 3,247 |
| July | 4,523 | 4,679 | 3,962 | 4,088 | 2,227 |
| August | 6,685 | 6,687 | 4,963 | 3,558 | 2,796 |
| September | 9,621 | 7,180 | 5,745 | 4,631 | 3,558 |
| October | 9,831 | 9,871 | 6,759 | 5,275 | 4,314 |
| November | 7,856 | 7,406 | 5,789 | 4,790 | 3,483 |
| December | 7,374 | 6,019 | 5,191 | 4,459 | 3,262 |
| Total | 94,245 | 78,678 | 59,847 | 49,381 | 37,147 |

1/Preliminary.
2/Revised.

Total production of fish sticks and fish portions during 1963 (173.1 million pounds) was 22.2 million pounds or 15 percent above 1962. Fish sticks (78.8 million pounds) were up 6.6 million pounds or 9 percent; and fish portions (94.3 million pounds) increased 15.6 million pounds or 20 percent.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED:

December 1963: During December 1963, a total of 33 vessels of 5 net tons and over was issued first documents as fishing craft as compared with 12 in December 1962. There were 27 documents cancelled for fishing vessels in December 1963 as compared with 24 in December 1962.

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, December 1963 with Comparisons

| Area (Home Port) | December | | January-December | |
|---------------------------------------|-----------|-----------|------------------|------------|
| | 1963 | 1962 | 1963 | 1962 |
|(Number)..... | | | | |
| <u>Issued first documents 2/:</u> | | | | |
| New England | 2 | 1 | 23 | 28 |
| Middle Atlantic | 1 | 1 | 18 | 3 |
| Chesapeake | 6 | 2 | 66 | 43 |
| South Atlantic | 6 | 1 | 77 | 47 |
| Gulf | 10 | 4 | 239 | 110 |
| Pacific | 8 | 3 | 160 | 130 |
| Great Lakes | - | - | 5 | 5 |
| Puerto Rico | - | - | 2 | 2 |
| Total | 33 | 12 | 590 | 368 |
| <u>Removed from documentation 3/:</u> | | | | |
| New England | 5 | 4 | 48 | 24 |
| Middle Atlantic | 3 | 5 | 47 | 39 |
| Chesapeake | 2 | - | 25 | 23 |
| South Atlantic | 4 | - | 53 | 38 |
| Gulf | 7 | 6 | 118 | 104 |
| Pacific | 5 | 8 | 87 | 111 |
| Great Lakes | 1 | 1 | 15 | 22 |
| Hawaii | - | - | 3 | 3 |
| Puerto Rico | - | - | - | 1 |
| Total | 27 | 24 | 396 | 365 |

1/For explanation of footnotes, see table 2.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, December 1963

| Gross Tonnage | Issued 2/ | Cancelled 3/ |
|--------------------|--------------------|--------------|
| |(Number)..... | |
| 5-9 | 7 | 7 |
| 10-19 | 10 | 9 |
| 20-29 | 6 | 2 |
| 30-39 | 1 | 1 |
| 40-49 | - | 3 |
| 50-59 | - | 1 |
| 60-69 | 2 | 2 |
| 70-79 | 5 | - |
| 80-89 | 1 | - |
| 90-99 | - | 1 |
| 110-119 | 1 | - |
| 130-139 | - | 1 |
| Total | 33 | 27 |

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Vessels issued first documents as fishing craft were built: 23 in 1963; 1 in 1959; 1 in 1958; 1 in 1957; 6 prior to 1951; and 1 unknown.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

1963 with Comparisons: The downward trend in United States vessels receiving first documents as fishing vessels was reversed in 1963 (tables 1 & 2) when documents issued

Table 1 - U. S. Fishing Vessels 1/--Documents Issued and Canceled, 1938-63

| Year | Issued | | | Canceled 2/ |
|--------------------|-----------------|-------------|-------|-------------|
| | First Documents | Redocuments | Total | |
|(Number)..... | | | | |
| 1963 | 569 | 21 | 590 | 396 |
| 1962 | 352 | 16 | 368 | 365 |
| 1961 | 410 | 20 | 430 | 341 |
| 1960 | 408 | 24 | 432 | 290 |
| 1959 | 479 | 34 | 513 | 3/ |
| 1958 | 684 | 29 | 713 | 3/ |
| 1957 | 601 | 18 | 619 | 3/ |
| 1956 | 521 | 17 | 538 | 3/ |
| 1955 | 418 | 23 | 441 | 3/ |
| 1954 | 717 | 28 | 745 | 3/ |
| 1953 | 729 | 25 | 754 | 3/ |
| 1952 | 675 | 24 | 699 | 3/ |
| 1951 | 780 | 28 | 808 | 3/ |
| 1950 | 812 | 29 | 841 | 3/ |
| 1949 | 1,002 | 42 | 1,044 | 3/ |
| 1948 | 1,184 | 38 | 1,222 | 3/ |
| 1947 | 1,300 | 48 | 1,348 | 3/ |
| 1946 | 1,085 | 117 | 1,202 | 3/ |
| 1945 | 741 | 3/ | 3/ | 3/ |
| 1944 | 635 | 3/ | 3/ | 3/ |
| 1943 | 358 | 3/ | 3/ | 3/ |
| 1942 | 358 | 3/ | 3/ | 3/ |
| 1941 | 354 | 3/ | 3/ | 3/ |
| 1940 | 320 | 3/ | 3/ | 3/ |
| 1939 | 357 | 3/ | 3/ | 3/ |
| 1938 | 376 | 3/ | 3/ | 3/ |

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

3/Data not compiled.

Table 2 - U. S. Fishing Vessels 1/--Documents Issued by Tonnage Groups, 1955-1963

| Tons | 1963 2/ | 1962 2/ | 1961 2/ | 1960 3/ | 1959 2/ | 1958 3/ | 1957 2/ | 1956 3/ | 1955 2/ |
|--------------|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| |(Number)..... | | | | | | | | |
| 5-9 | 123 | 63 | 134 | 227 | 231 | 241 | 246 | 252 | 214 |
| 10-19 | 178 | 137 | 130 | 90 | 96 | 111 | 121 | 103 | 88 |
| 20-29 | 61 | 33 | 37 | 33 | 69 | 107 | 69 | 59 | 41 |
| 30-39 | 23 | 33 | 27 | 16 | 34 | 135 | 110 | 62 | 36 |
| 40-49 | 35 | 15 | 19 | 18 | 25 | 65 | 25 | 4 | 12 |
| 50-59 | 16 | 9 | 21 | 5 | 10 | 13 | 13 | 5 | 5 |
| 60-69 | 33 | 17 | 21 | 2 | 2 | 1 | 1 | 2 | 1 |
| 70-79 | 73 | 36 | 17 | - | - | - | - | 2 | 4 |
| 80-89 | 12 | 3 | 2 | 1 | 1 | 1 | 1 | - | - |
| 90-99 | 2 | 1 | 3 | - | 2 | 3 | - | - | 2 |
| 100-109 | 3 | 1 | - | - | - | - | 2 | 4 | 4 |
| 110-119 | 3 | 3 | 1 | 1 | 1 | - | 1 | 3 | 1 |
| 120-129 | - | 1 | - | - | - | - | 2 | 8 | 1 |
| 130-139 | - | 2 | 1 | 1 | 1 | - | 3 | 4 | 2 |
| 140-149 | 9 | - | - | 1 | 1 | - | - | - | 2 |
| 150-159 | 1 | - | - | 2 | - | - | - | 3 | 2 |
| 160-169 | 1 | - | 1 | - | 1 | 1 | - | - | - |
| 170-179 | - | - | - | - | 1 | - | 2 | 1 | - |
| 180-189 | - | - | - | - | 2 | 3 | 2 | 3 | 2 |
| 190-199 | - | - | 1 | 1 | - | 1 | - | - | 1 |
| 200-249 | 3 | 4 | 2 | 2 | - | 1 | - | - | - |
| 250-299 | 5 | 2 | 2 | 2 | 1 | - | - | - | - |
| 300-349 | 2 | 1 | 1 | 6 | - | 1 | 1 | - | - |
| 350-399 | - | - | 2 | - | 1 | - | 2 | - | - |
| 450-499 | 3 | 2 | 1 | - | - | - | - | - | - |
| 500-549 | - | 2 | 1 | - | - | - | - | - | - |
| 550-599 | - | 1 | 3 | - | - | - | - | - | - |
| 600-649 | 1 | - | - | - | - | - | - | - | - |
| 750-799 | 2 | 1 | 1 | - | - | - | - | - | - |
| 800-849 | 1 | 1 | 2 | - | - | - | - | - | - |
| Total | 590 | 368 | 430 | 408 | 479 | 684 | 601 | 521 | 418 |

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Based on gross tons. Redocumented vessels that were previously removed from the records are included in the following years: 1961, 20, 1962, 16; and 1963, 21.

3/Based on net tons. Includes only vessels receiving first documents.

showed an increase of 60 percent over 1962. Although much of the gain was concentrated in vessels of less than 20 tons, there was also some increase in most of the larger tonnage groups.

Documents issued in 1963 exceeded cancellations by 194 vessels. In the previous year, documents cancelled almost equalled those issued.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U. S. Foreign Trade

IMPORTS OF FISH MEAL AND SCRAP BY CUSTOMS DISTRICTS, JANUARY-DECEMBER 1963:

United States imports of fish meal and scrap in 1963 totaled 383,107 short tons, according to preliminary data. About 83.3 percent of the fish meal and scrap imports in 1963 entered through the Customs Districts

AIRBORNE IMPORTS OF FISHERY PRODUCTS, NOVEMBER 1963:

Airborne fishery imports into the United States in November 1963 were up 15.3 percent in quantity and 2.0 percent in value from those in the previous month. Total airborne imports during January-November 1963 were about the same as those in the same period of 1962.

Raw headless shrimp continued to make up the bulk of the airborne shrimp imports--in November 1963, shipments consisted of 454,857 pounds of fresh or frozen raw headless, 20,735 pounds of frozen raw peeled, and 53,006 pounds of unclassified shrimp. Over 92 percent of the airborne shrimp arrivals in November entered through the U. S. Customs District of Florida. The remainder entered through the Customs Districts of New Orleans (La.), Laredo (Tex.), Los Angeles (Calif.), and San Francisco (Calif.).

Airborne imports of shellfish other than shrimp in November consisted mainly of 46,521 pounds of fresh or frozen spiny lobster products. All of the airborne imports

United States Imports of Fish Meal and Scrap by Customs Districts, January-December 1963^{1/}

| Customs Districts | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| (Short Tons) | | | | | | | | | | | | | |
| Maine and New Hampshire . . | 50 | 602 | - | - | 500 | 50 | 352 | 551 | 460 | 120 | 679 | 500 | 3,864 |
| Vermont | 29 | - | - | - | - | 35 | 65 | - | 96 | 30 | - | - | 255 |
| Massachusetts | - | 852 | 80 | 15 | - | 60 | 90 | 160 | 185 | 29 | 72 | 67 | 1,610 |
| St. Lawrence (N. Y.) . | - | - | 33 | - | - | - | 30 | 60 | - | 30 | - | - | 153 |
| Buffalo (N. Y.) | - | - | - | - | - | - | - | 3 | - | - | - | - | 3 |
| New York (N. Y.) . . . | 650 | 880 | - | 1,028 | 501 | 300 | 1,102 | 220 | 578 | 40 | 129 | 242 | 5,680 |
| Philadelphia (Pa.) . . | - | 1,414 | 728 | 250 | - | 100 | 100 | - | - | - | - | - | 2,814 |
| Maryland | 551 | 4,684 | 4,682 | 1,492 | 2,645 | 1,298 | 661 | 2,362 | 1,758 | 6,338 | 882 | 7,074 | 34,427 |
| North Carolina | 108 | - | 3,583 | 1,102 | 1,102 | - | 772 | 1,268 | 937 | 1,378 | 1,433 | 331 | 12,014 |
| Georgia | 2,589 | 5,239 | 12,897 | 2,035 | 9,532 | 2,147 | 4,964 | 6,510 | 3,145 | 4,253 | - | 3,351 | 56,662 |
| Florida | - | - | - | - | - | - | - | - | 518 | - | - | - | 548 |
| Mobile (Ala.) | 4,132 | 8,135 | 11,195 | 2,019 | 3,972 | 4,058 | 4,961 | 5,422 | 9,399 | 4,435 | 1,314 | 6,335 | 65,377 |
| New Orleans (La.) . . . | 2,949 | - | - | - | 551 | - | 1,488 | - | - | - | 1,540 | - | 6,528 |
| Sabine (Tex.) | 546 | 546 | 551 | 551 | - | - | 557 | - | - | 1,114 | - | - | 4,422 |
| Galveston (Tex.) . . . | 1,101 | 8,829 | 3,060 | 2,427 | 4,781 | 2,372 | 2,579 | 4,084 | 8,829 | 2,989 | 4,159 | 2,328 | 47,538 |
| Los Angeles (Calif.) . . | - | 1,828 | 2,662 | 1,492 | 1,148 | 1,009 | 4,295 | 6,405 | 2,643 | 2,639 | 330 | 1,187 | 25,639 |
| San Francisco (Calif.) . | 2,646 | 4,290 | 4,027 | 9,568 | 2,225 | 1,167 | 6,013 | 12,648 | 2,978 | 4,063 | 3,154 | 3,129 | 55,908 |
| Oregon | 308 | - | 219 | 479 | 219 | 165 | - | - | - | - | - | 343 | 1,843 |
| Washington | 1,782 | 2,140 | 2,311 | 2,906 | 2,710 | 3,713 | 4,892 | 2,405 | 2,125 | 2,943 | 2,360 | 3,136 | 33,423 |
| Hawaii | - | 40 | 591 | - | 15 | 55 | 8,262 | 20 | 15 | - | 100 | - | 9,098 |
| Montana & Idaho | - | - | 10 | - | - | - | - | - | - | - | - | - | 10 |
| Dakota | 134 | 60 | 158 | 115 | 136 | 245 | 257 | 385 | 190 | 195 | 210 | - | 2,085 |
| Duluth (Minn.) and Superior (Wisc.) | 743 | 530 | 917 | 1,070 | 1,015 | 1,445 | 1,538 | 980 | 435 | 456 | 263 | 550 | 9,942 |
| Michigan | 167 | 17 | 34 | 58 | 97 | 233 | 188 | 503 | 375 | 397 | 401 | 62 | 2,532 |
| Chicago (Ill.) | - | - | 157 | - | - | - | 22 | - | - | - | - | - | 179 |
| Colorado | - | - | - | - | - | - | 35 | - | - | - | - | - | 35 |
| Grand total | 18,495 | 40,086 | 47,895 | 26,607 | 31,149 | 18,452 | 43,223 | 43,987 | 34,666 | 31,449 | 17,369 | 29,729 | 383,107 |

^{1/}Preliminary.

of Maryland, Georgia, Mobile (Ala.), Galveston (Tex.), San Francisco (Calif.), Los Angeles (Calif.), and Washington.

of spiny lobsters entered through the Customs District of Florida.

Fish fillets from Mexico were the leading finfish products imported by air in November.

| U. S.1/ Airborne Imports of Fishery Products, January-November 1963 with Comparative Data | | | | | | |
|--|---------------|---------------|----------------|----------------|----------------|----------------|
| Product and Origin 2/ | 1963 | | 1963 | | 1962 | |
| | November | | Jan.-Nov. | | Jan.-Nov. | |
| | Qty. 3/ | Value 4/ | Qty. 3/ | Value 4/ | Qty. 3/ | Value 4/ |
| | 1,000 Lbs. | U.S. 1,000 | 1,000 Lbs. | U.S. 1,000 | 1,000 Lbs. | U.S. 1,000 |
| Fish: | | | | | | |
| Mexico | 19.6 | 3.6 | 264.8 | 70.0 | 964.2 | 160.2 |
| British Honduras | 1.8 | 0.5 | 43.5 | 10.7 | 34.2 | 7.5 |
| Honduras | - | - | 16.5 | 4.3 | 0.8 | 0.3 |
| Japan | - | - | 2.0 | 8.2 | - | - |
| United Kingdom | 0.4 | 0.7 | 3.5 | 7.4 | 0.5 | 1.2 |
| Iran | - | - | 1.2 | 7.4 | 13.9 | 142.9 |
| France | 4.9 | 4.5 | 10.1 | 10.6 | 0.3 | 0.7 |
| Rumania | - | - | - | - | 1.9 | 15.9 |
| Panama | - | - | 0.9 | 0.4 | 7.8 | 1.3 |
| U.S.S.R. | - | - | 26.8 | 70.2 | - | - |
| Canada | - | - | - | - | 22.1 | 17.6 |
| Costa Rica | - | - | - | - | 5.6 | 0.9 |
| Other countries | - | - | 3.5 | 0.9 | 39.0 | 12.8 |
| Total Fish | 26.7 | 9.3 | 372.8 | 190.1 | 1,090.3 | 361.3 |
| Shrimp: | | | | | | |
| Guatemala | - | - | 141.6 | 74.0 | 292.8 | 146.7 |
| El Salvador | 39.7 | 17.5 | 297.7 | 190.2 | 623.5 | 387.4 |
| Honduras | - | - | 99.8 | 52.3 | 36.5 | 23.3 |
| Nicaragua | 27.8 | 15.5 | 505.0 | 174.6 | 996.4 | 339.6 |
| Costa Rica | 15.8 | 5.4 | 598.3 | 284.3 | 679.3 | 303.1 |
| Panama | 98.8 | 55.3 | 1,541.3 | 831.5 | 1,739.3 | 970.2 |
| Venezuela | 338.6 | 140.7 | 4,500.5 | 2,096.8 | 3,033.3 | 1,644.2 |
| Ecuador | - | - | 111.6 | 39.4 | 12.2 | 3.4 |
| France | - | - | 2.6 | 0.9 | - | - |
| Mexico | - | - | 13.2 | 6.9 | 24.8 | 9.1 |
| Netherlands Antilles | - | - | - | - | 3.1 | 2.7 |
| Argentina | - | - | - | - | 10.5 | 4.8 |
| British Honduras | 7.9 | 8.6 | 7.9 | 8.6 | - | - |
| Total Shrimp | 528.6 | 243.0 | 7,819.5 | 3,759.5 | 7,451.7 | 3,834.5 |
| Shellfish other than Shrimp: | | | | | | |
| Mexico | 3.5 | 3.2 | 101.1 | 60.8 | 87.7 | 55.9 |
| British Honduras | 34.6 | 28.1 | 344.5 | 281.8 | 266.0 | 176.4 |
| El Salvador | - | - | 5.0 | 3.6 | 6.2 | 4.6 |
| Honduras | - | - | 17.0 | 7.0 | 140.7 | 103.9 |
| Nicaragua | - | - | 164.5 | 100.0 | 1.2 | 0.6 |
| Costa Rica | - | - | 73.8 | 60.1 | 5.6 | 4.8 |
| Jamaica | 0.8 | 0.7 | 66.5 | 50.2 | 30.0 | 21.3 |
| Netherlands Antilles | 12.7 | 11.8 | 45.5 | 32.7 | 58.0 | 34.8 |
| Colombia | - | - | 8.0 | 21.7 | 1.8 | 5.1 |
| Ecuador | - | - | 2.2 | 1.8 | 2.6 | 1.6 |
| Tunisia | - | - | 0.8 | 0.9 | - | - |
| Leeward and Windward Islands | - | - | 1.6 | 0.5 | 28.7 | 10.9 |
| British Guiana | - | - | 1.7 | 0.3 | - | - |
| Canada | - | - | 213.3 | 109.2 | 224.1 | 91.1 |
| Venezuela | - | - | 13.7 | 6.0 | 22.3 | 13.6 |
| Panama | 1.9 | 1.2 | 5.0 | 3.8 | 1.0 | 1.0 |
| Guatemala | - | - | - | - | 12.9 | 6.3 |
| Bahamas | - | - | 5.3 | 5.2 | 32.5 | 11.0 |
| Dominican Republic | - | - | 25.3 | 23.8 | 29.7 | 26.5 |
| Yugoslavia | - | - | 1.2 | 0.7 | - | - |
| Trinidad | - | - | - | - | 2.3 | 1.0 |
| Other countries | - | - | 2.0 | 2.9 | 8.3 | 12.0 |
| Total Shellfish (except shrimp) | 53.5 | 45.0 | 1,098.0 | 773.0 | 961.6 | 582.4 |
| Grand Total | 608.8 | 297.3 | 9,290.3 | 4,722.6 | 9,503.6 | 4,778.2 |

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.
 2/When the country of origin is not known, the country of shipment is shown.
 3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.
 4/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.
 Note: These data are included in the over-all import figures for total imports, i.e., these imports are not to be added to other import data published.
 Source: United States Airborne General Imports of Merchandise, FT 380, November 1963, U. S. Bureau of Census.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne

imports consists of fresh and frozen products.

PROCESSED EDIBLE FISHERY PRODUCTS, DECEMBER 1963:

United States imports of processed edible fishery products in December 1963 were down 17.1 percent in quantity and 7.4 percent in value from those in the previous month. In December 1963 there was a decline in imports of ground-fish fillets, canned sardines in oil, and canned oysters, which was partly offset by higher imports of canned tuna in brine and canned sardines not in oil.

Compared with the same month in 1962, imports in December 1963 were up 3.9 percent in quantity and 16.1 percent in value. The gain was due mainly to larger imports of canned tuna in brine and fish blocks and slabs. There was a decline in imports of canned sardines (in oil and not in oil) and most fish fillet items, particularly swordfish and haddock fillets.

U. S. Imports and Exports of Processed Edible Fishery Products, December 1963 with Comparisons

| Item | QUANTITY | | | | VALUE | | | |
|------------------------------|--------------------------|------|-----------|-------|------------------------|------|-----------|-------|
| | December | | Jan.-Dec. | | December | | Jan.-Dec. | |
| | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 | 1963 | 1962 |
| | .. (Millions of Lbs.) .. | | | | .. (Millions of \$) .. | | | |
| Fish & Shellfish: | | | | | | | | |
| Imports 1/ | 42.9 | 41.3 | 535.3 | 552.0 | 13.7 | 11.8 | 157.4 | 160.6 |
| Exports 2/ | 4.3 | 4.8 | 34.4 | 35.6 | 2.1 | 2.1 | 16.6 | 16.0 |

1/Includes only those fishery products classified by the U. S. Bureau of the Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i.e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).
 2/Excludes fresh and frozen.

For the year 1963, imports were down 3.0 percent in quantity and 2.0 percent in value from those in 1962. Fluctuations in individual items were much greater than the overall totals indicate. Imports were down sharply in 1963 for canned sardines in oil and canned salmon. There was also a considerable decline in imports of haddock fillets, flounder fillets, halibut fillets, swordfish fillets, sea catfish fillets, and canned tuna other than albacore in brine. On the other hand, there was a large increase in imports of fish blocks and slabs as well as heavier shipments of ocean perch fillets, yellow pike fillets, canned albacore tuna in brine, canned sardines not in oil, canned crab meat, and canned oysters.

Exports of processed edible fish and shellfish from the United States in December 1963 were up 16.2 percent in quantity and 16.7 percent in value from those in the previous month. In December, all of the leading canned fish export items were exported in larger quantity except canned sardines not in oil.

Compared with the same month in 1962, the exports in December 1963 were down 10.4 percent in quantity but the value was the same in both months. This December there were larger shipments of canned mackerel and canned shrimp, but exports of canned sardines not in oil were sharply lower.

Processed fish and shellfish exports in 1963 were down 3.4 percent in quantity but up 3.8 percent in value from those in 1962. The decline in quantity was due mainly to lower shipments of canned sardines not in oil. There were increases in exports of the higher-priced canned salmon and canned shrimp, as well as larger shipments of canned squid and canned mackerel. Although not covered in the table, exports of frozen shrimp were up sharply in 1963 (increase mostly in exports to Japan), and there was a substantial increase in exports of frozen salmon.

Notes: (1) Prior to October 1963, the data shown were included in news releases on "U. S. Imports and Exports of Edible Fishery Products." Before October 1963, data showing "U.S. Imports of Edible Fishery Products" summarized both manufactured and crude products. At present, a monthly summary of U.S. imports of crude or nonprocessed fishery products is not available, therefore, only imports of manufactured or processed edible fishery products are reported. The import data are, therefore, not comparable to previous reports of "U.S. Imports of Edible Fishery Products."

The export data shown are comparable to previous data in "U.S. Exports of Edible Fishery Products." The export data in this series of articles have always been limited to manufactured or processed products.

(2) See *Commercial Fisheries Review*, Mar. 1964 p. 31.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, FEBRUARY 1964:

The wholesale price index for edible fish and shellfish (fresh, frozen, and canned) in February 1964 dropped 0.7 percent from the previous month. It was the first decline since November 1963 following a series of price increases through January this year. The decline from January to February was due to lower prices for frozen halibut and salmon, ocean perch fillets, oysters, frozen shrimp, and canned salmon. But these were partly offset by higher February prices for Great Lakes fresh-water fish, fresh shrimp, and several of the other canned fish products. At 109.0 percent of the 1957-59 average, the index this February was 7.9 percent lower than the same month a year earlier when prices, with few exceptions, were higher for nearly all items.

The drawn, dressed, or whole finfish subgroup index in February 1964 was up 3.7 percent from a month earlier, but was lower by 1.5 percent as compared with February a year ago. Largely responsible for the increase from January to February were higher prices at Boston for ex-vessel large haddock (up 13.6 percent), at Chicago for fresh Lake Superior whitefish (up 23.6 percent), and at New York City for Great Lakes round yellow pike (up 26.5 percent). Compared with February 1963, prices this February were lower for all items in the subgroup except for fresh drawn haddock at Boston which this February was priced sharply higher (up 69.3 percent) because of fewer trips and generally high ex-vessel prices.

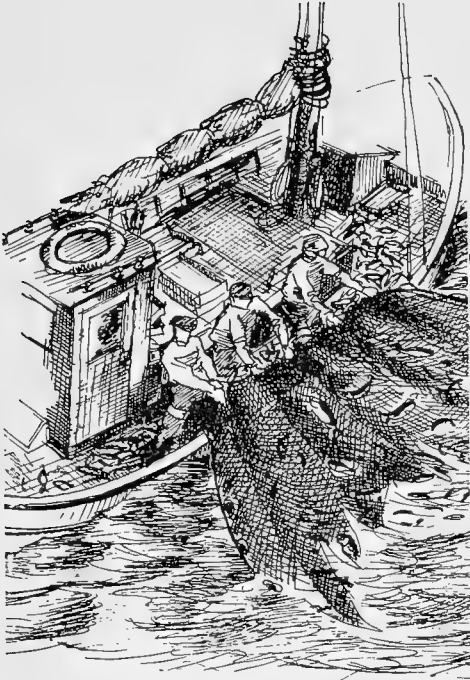
Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1964 with Comparisons

| Group, Subgroup, and Item Specification | Point of Pricing | Unit | Avg. Prices 1/ (\$) | | Indexes (1957-59=100) | | | |
|---|------------------|------|---------------------|-----------|-----------------------|-----------|-----------|-----------|
| | | | Feb. 1964 | Jan. 1964 | Feb. 1964 | Jan. 1964 | Dec. 1963 | Feb. 1963 |
| ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) | | | | | 109.0 | 2/109.8 | 107.5 | 118.4 |
| Fresh & Frozen Fishery Products: | | | | | 113.2 | 113.0 | 110.5 | 124.4 |
| Drawn, Dressed, or Whole Finfish: | | | | | 120.8 | 116.5 | 114.4 | 122.7 |
| Haddock, lge., offshore, drawn, fresh | Boston | lb. | .21 | .18 | 160.2 | 141.0 | 133.0 | 94.6 |
| Halibut, West., 20/80 lbs., drsd., fresh or froz. | New York | lb. | .31 | .33 | 90.2 | 96.1 | 96.1 | 125.6 |
| Salmon, king, lge. & med., drsd., fresh or froz. | New York | lb. | .83 | .85 | 116.0 | 118.4 | 118.4 | 133.8 |
| Whitefish, L. Superior, drawn, fresh | Chicago | lb. | .58 | .47 | 85.8 | 69.4 | 61.2 | 100.7 |
| Yellow pike, L. Michigan & Huron, rnd., fresh | New York | lb. | .62 | .49 | 101.6 | 2/80.3 | 83.5 | 113.0 |
| Processed, Fresh (Fish & Shellfish): | | | | | 114.0 | 115.4 | 111.5 | 128.5 |
| Fillets, haddock, sml., skins on, 20-lb. tins | Boston | lb. | .58 | .59 | 140.8 | 142.0 | 138.4 | 98.3 |
| Shrimp, lge. (26-30 count), headless, fresh | New York | lb. | .91 | .86 | 106.6 | 100.8 | 95.5 | 130.7 |
| Oysters, shucked, standards | Norfolk | gal. | 7.00 | 7.63 | 118.0 | 128.6 | 126.5 | 130.7 |
| Processed, Frozen (Fish & Shellfish): | | | | | 100.7 | 102.8 | 101.3 | 117.3 |
| Fillets: Flounder, skinless, 1-lb. pkg. | Boston | lb. | .39 | .39 | 98.9 | 98.9 | 98.9 | 98.9 |
| Haddock, sml., skins on, 1-lb. pkg. | Boston | lb. | .40 | .39 | 115.8 | 114.3 | 115.8 | 108.5 |
| Ocean perch, lge., skins on 1-lb. pkg. | Boston | lb. | .33 | .34 | 114.0 | 117.5 | 121.0 | 115.7 |
| Shrimp, lge. (26-30 count), brown, 5-lb. pkg. | Chicago | lb. | .77 | .81 | 91.3 | 95.5 | 91.9 | 123.4 |
| Canned Fishery Products: | | | | | 102.0 | 104.7 | 102.5 | 108.0 |
| Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. | Seattle | cs. | 21.75 | 23.50 | 94.8 | 102.4 | 102.4 | 107.9 |
| Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. | Los Angeles | cs. | 11.63 | 11.63 | 103.3 | 103.3 | 98.2 | 104.4 |
| Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs. | Los Angeles | cs. | 6.13 | 5.75 | 103.9 | 97.5 | 97.5 | 3/100.0 |
| Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. | New York | cs. | 9.09 | 8.96 | 116.5 | 114.9 | 114.9 | 119.4 |

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/Revised.

3/New product replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.



Slightly lower prices this February for fresh haddock fillets (down 0.8 percent) at Boston and an 8.2-percent drop in prices for fresh shucked oysters at Norfolk caused a 1.2-percent decline from the previous month in the subgroup index for fresh processed fish and shellfish. Fresh shrimp prices at New York City were higher (up 5.8 percent) than in January but were below February 1963 by 18.4 percent. As compared with February 1963, prices this February were lower for most items in the subgroup and the index was down 11.3 percent. But prices for fresh haddock fillets were a marked exception-- they were 43.2 percent higher this February than in the same month in 1963.

The February 1964 processed frozen fish and shellfish subgroup index dropped 2.0 percent from the previous month mainly because of a 4-cent-a-pound drop in wholesale prices for frozen shrimp at Chicago and lower prices for ocean perch fillets. Prices for frozen haddock fillets were up slightly from January to February and increased 6.7 percent from February a year earlier. The February 1964 subgroup index was down 14.2 percent from the same month in 1963 principally due to lower frozen shrimp prices (down 16.0 percent) at Chicago.

Wholesale prices for canned pink salmon in February 1964 were reduced by a leading Pacific Northwest packer and this resulted in a 2.6-percent decline from the previous month in the subgroup index for canned fishery products. Canned salmon prices this February were down 7.4 percent from a month earlier and were lower than February 1963 by 12.1 percent. From January to February prices were higher for canned Maine sardines (up 1.4 percent) as stocks declined, and canned California jack mackerel (up 6.6 percent). Compared with February 1963, the subgroup index this February was down 5.6 percent because of lower prices for nearly all canned fish items.



NEW SALMON HATCHERY TECHNIQUES

In their constant search for ways and means of increasing salmon production, biologists of the Fisheries Research Board of Canada in British Columbia are developing a new hatchery technique. They let the fish release themselves instead of releasing them in bulk when they are thought to be at the right stage for migration.

The Board's Biological Station at Nanaimo, B. C., has described experiments to test new techniques for rearing and release of pink salmon fry in hatcheries at Kleanza Creek on the Skeena River. The small fish have a tendency to hide themselves in daylight and move downstream at night, and the experiments have shown that when reared in darkness at temperatures close to those in nature, fry will release themselves from overflowing troughs at about the same time and stage of development as those at which they would emerge from gravel. Thus normal behavior patterns are not disturbed, and with higher survival of fry, the future runs of salmon may be increased.

The swimming speeds of adult salmon were the subject of another experiment by the Nanaimo station. Knowledge of what speeds the salmon can sustain is essential in the construction of fishways, and it was found that an adult sockeye can keep up a speed of two and one-half feet per second for 100 hours, but suffers fatigue at three feet per second. In one instance two salmon were still swimming after covering the equivalent of 175 miles in three and a half days. (Trade News, Canadian Department of Fisheries, February 1961.)



International

COMMISSION FOR TECHNICAL COOPERATION IN AFRICA

SPECIALIST MEETING ON CRUSTACEANS HELD IN ZANZIBAR:

A Specialist Meeting on Crustaceans was scheduled for April 19-26, 1964, in Zanzibar by the Commission for Technical Cooperation in Africa (CCTA). The Scientific Council for Africa, recognizing the importance of the fishing industry in the developing countries of Africa, decided at a previous meeting, and confirmed at its 13th meeting held in September 1962, to devote one of its Specialist Meetings in 1964 to crustaceans.

Specialists have been invited to attend from Ethiopia, Senegal, Sudan, Zanzibar, Great Britain, and France. The U. S. Agency for International Development (AID) has been invited to send observers to the meeting.

Topics for discussion on the agenda of the Specialist Meeting on Crustaceans include:

(1) The ecological position of crustaceans (including parasitism) and their role in the nutritional chain; (2) crabs and sundry crustaceans; (3) Atlantic shrimp--penaeides and other prawns; (4) Indian Ocean and Red Sea shrimp; (5) Crayfish--"jasus" (Cape crayfish) and other crayfish. (United States Embassy, Lagos, February 9, 1964.)

EUROPEAN ECONOMIC COMMUNITY

TARIFF QUOTAS ON SOME FISHERY PRODUCTS GRANTED TO CERTAIN MEMBER STATES:

Certain fishery products are included in additional tariff quotas for 1964 granted by the European Economic Community (EEC) to individual Member States. A tariff quota allows the EEC country named to import the specified quantities at reduced tariff rates.

The products granted tariff quotas include some agricultural items, chemicals, cork

and cork products, as well as certain types of fish. Many of those commodities were also subject to tariff quotas during 1963. Except for the chemicals, cork, and some fish, which are exempt from customs duties, the quotas provide for some in-quota duty to be paid. This is consistent with the EEC Commission's philosophy that the national quota is a temporary device, and some duty must be levied in order to reflect the progress of the community as a whole toward the final and integral application of the Common External Tariff.

Fishery items granted tariff quotas to beneficiary Member States and in-quota duty rates for the year 1964 are:

Italy: Tuna for the canning industry, 25,000 metric tons--duty free; Cod, 34,000 tons--duty free; Cod fillets, 2,000 tons--3 percent.

The following tariff quotas are for 1964 and the first three months of 1965.

German Federal Republic: Dogfish, fresh, 3,000 tons--3 percent; Saithe, salted, 2,000 tons--7 percent.

Belgium-Luxembourg: Crab and shrimp, 250 tons--3 percent.

The EEC decided on the above exemptions in December 1963. The authority in granting such tariff quotas is contained in Article 25 of the Rome Treaty. (International Commerce, February 3, 1964.)

EUROPEAN FREE TRADE ASSOCIATION

TARIFF REDUCTION ON CERTAIN FISHERY PRODUCTS:

At their meeting in May 1963, The European Free Trade Association (EFTA) Ministers decided on an accelerated timetable for tariff reduction on industrial goods traded between the 7 member countries of the Associa-

International (Contd.):

tion (Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom), and between them and Finland (as associate member of EFTA). Under the accelerated timetable, the tariffs on industrial goods were reduced on December 31, 1963, to 40 percent of base rates. Fishery and agricultural products had not been included in the industrial goods category. However, as a result of reclassification, the tariffs on whale meat and a number of agricultural products were also reduced on December 31, 1963, to 40 percent of base rates.

In addition, on December 31, 1963, the United Kingdom (but not other EFTA countries) reduced or eliminated import duties on certain fishery products from EFTA countries. The tariff cuts affected whale meat and certain fishery products (except chilled or frozen fish fillets) which had already been subjected to reduced EFTA rates of duty. Reduction was made in accordance with the following schedule:

(a) Tariffs on the following products (previously reduced for EFTA to less than 5 percent ad valorem) were eliminated on December 31, 1963: fish roe (other than caviar or caviar substitutes) prepared or preserved, canned salmon, and canned prawns and canned shrimp.

(b) Tariffs on the following products (previously standing for EFTA at 5 percent ad valorem or more) were reduced by one-half on December 31, 1963, and will be eliminated on December 31, 1964: peeled shrimp (chilled or frozen); fish waste; salted fish roe; cod-liver oil; fats and oils of fish and marine mammals, whether or not refined; oils wholly obtained from fish or marine mammals; fatty acids, acid oils (from refining), fatty alcohols, wholly obtained from fish or marine mammals; fats and oils wholly obtained from fish or marine mammals; spermaceti, crude, etc; prepared or preserved fish--other than the products covered by (a) above; prepared or preserved crustaceans and molluscs--other than the products covered by (a) above; flours and meals of meat, offals, fish, crustaceans or molluscs, unfit for human consumption; and fish solubles.

(c) The tariff on whale meat for EFTA was reduced to $2\frac{1}{2}$ percent ad valorem on December 31, 1963, and will be eliminated

on December 31, 1964. (Board of Trade Journal, December 20, 1963.)

Note: See Commercial Fisheries Review, October 1963 p. 39.

FISHING LIMITS

SCANDINAVIAN COUNTRIES OPPOSE
FISHING LIMITS PROPOSAL AT
EUROPEAN FISHERIES
CONFERENCE IN LONDON:

At the European Fisheries Conference held in London in January 1964, Norway and Iceland refused to participate in the meetings of the Special Committee on Fishery Boundaries. This Special Committee was commissioned on January 13 to draw up a proposal for an agreement based on the joint United Kingdom-Common Market proposal for 6-mile fishery boundaries with permanent fishing rights between 6 and 12 miles off the coasts for fishing vessels from nations which have traditionally fished in those waters.

Norway's decision to place itself outside the London Fishery Conference was motivated by the assumption that Norwegian participation in the fishery boundary committee could be interpreted as an approval in principle of the proposal placed before the committee. The Norwegian delegation is bound by the Storting (Parliament) decision to the effect that a 12-mile fishery boundary will be established in 1970 after the completion of the current transition period, during which fishing vessels from certain countries are allowed to fish in the areas between 6 and 12 miles off the coast.

The proceedings of the Conference have attracted much attention in Iceland. Interest is particularly focused on the fishing limits question and the opposition of the Scandinavian countries to the "six plus six" formula proposed by the European Economic Community (EEC) countries and Great Britain.

Iceland's Foreign Minister told the press that Iceland had clearly indicated that it would not discuss any alteration of its 12-mile limit and that the agreements reached by the Conference will not have any effect on that limit. He added that Iceland will study the results of the Conference and then make a decision on further participation when the Conference reconvened on February 26.

Permission, which the British received under the terms of the 1961 Icelandic-British

International (Contd.):

fisheries agreement, to fish over a period of three years in certain specified areas between the 12- and 6-mile limits for a restricted time each year expired in March 1964. The Icelandic Government has categorically affirmed that this permission will not be renewed, and the British, for their part, have indicated that they would not request a renewal. (United States Embassy, Oslo, January 22, and Reykjavik, January 21, 1964.)

FISH MEAL

**PRODUCTION AND EXPORTS FOR
SELECTED COUNTRIES,
JANUARY-NOVEMBER 1963:**

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Angola, Iceland, Norway, Peru, and South Africa/South-West Africa. Exports of fish meal by FEO countries during January-November 1963 were up 11.3 percent and their production was up 5.4 percent in quantity from that in the same period of the previous year.

| Country | Nov. | | Jan.-Nov. | |
|--------------------------------|-------|-------|-----------|---------|
| | 1963 | 1962 | 1963 | 1962 |
| ... (1,000 Metric Tons) ... | | | | |
| Angola | 1.8 | 3.4 | 23.1 | 28.7 |
| Iceland | 14.7 | 4.4 | 81.5 | 63.4 |
| Norway | 15.9 | 10.2 | 84.5 | 51.3 |
| Peru | 90.5 | 94.5 | 1,054.7 | 958.3 |
| So. Africa (incl. S.W. Africa) | 18.3 | 9.7 | 185.0 | 181.7 |
| Total | 141.2 | 122.2 | 1,428.8 | 1,283.4 |

| Country | Nov. | | Jan.-Nov. | |
|--------------------------------|-------|-------|-----------|---------|
| | 1963 | 1962 | 1963 | 1962 |
| ... (1,000 Metric Tons) ... | | | | |
| Angola | 3.0 | 4.4 | 24.0 | 29.1 |
| Iceland | 0.8 | 1.2 | 79.1 | 94.1 |
| Norway | 12.1 | 9.1 | 122.1 | 116.2 |
| Peru | 116.1 | 145.6 | 1,019.5 | 964.8 |
| So. Africa (incl. S.W. Africa) | 3.8 | 0.8 | 237.0 | 201.3 |
| Total | 135.8 | 161.1 | 1,481.7 | 1,405.5 |

During the first 11 months of 1963, Peru accounted for 73.8 percent of total fish meal exports by FEO countries, followed by South Africa with 13.0 percent, Norway with 5.9 percent, Iceland with 5.7 percent, and Angola with 1.6 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 29, 1964.)

FOOD AND AGRICULTURE ORGANIZATION

**ADVISORY COMMITTEE ON MARINE
RESOURCES RESEARCH MEETS IN ROME:**

The second meeting of the Advisory Committee on Marine Resources Research of the Food and Agriculture Organization (FAO) was held in Rome, February 6-12, 1964. The committee was to review the FAO Fisheries Division's present work in marine resources research and was to propose guidelines for the future programs.

This year's Advisory Committee session was preceded by meetings of working groups on general plans for a proposed world ocean study and on the use for fisheries purposes of data coming from automatic oceanographic buoys. A meeting was also planned of members of a working group on the marine aspects of the International Biological Program now being organized by the International Council of Scientific Unions.

The Advisory Committee, established in October 1962, meets once a year and reports its findings to B. R. Sen, FAO's Director-General. The Committee is made up of 15 fisheries scientists from 11 nations, who are selected on the basis of their expert knowledge and not as representatives of governments. In addition to its FAO role, the Committee acts as the advisory group on oceanographic aspects of fisheries to the Intergovernmental Oceanographic Commission under the United Nations Educational, Scientific and Cultural Organization (UNESCO).

The Committee chairman is Dr. Alfred W. H. Needler, Deputy Minister of Fisheries of Canada. Dr. Cyril Lucas, Director of Marine Laboratory, Department of Agriculture and Fisheries for Scotland, is vice-chairman. Director Donald L. McKernan, Bureau of Commercial Fisheries, U. S. Department of the Interior, is a member of the Advisory Committee.

* * * * *

WORLD OCEANS CAN YIELD MORE FOOD:

The world's ocean resources are capable of providing man with far more high-quality protein food than they do now, according to the Advisory Committee on Marine Resources Research of the Food and Agriculture Organization (FAO), which met in Rome during February.

International (Contd.):

To realize such an increased harvest, however, says the committee's final report, there is an urgent need for better knowledge of the resources themselves and how they can best be exploited. The report points out that the growth of modern commercial fishing is one of the major problems facing an increased and more logical harvesting of the seas: "While full rational exploitation of the fish stocks requires increases in fishing effort in many areas, there is a great danger that the rapid growth and greater mobility of fleets will lead to overfishing of some stocks before research has revealed the limits of their productive capacity."

Man's growing ability to predict changes in oceanographic conditions in present or potential fishing areas was of major significance. But further progress in that work depends on marine research being planned on a worldwide basis, the Committee said. The world's fisheries are the common property of mankind, the Committee added, and can only be rationally exploited if there is developed well-coordinated international research on marine resources. "In this explosive situation FAO has a major responsibility and a most important part to play," says the Committee report.

The Advisory Committee recommended that FAO's program in marine resources research be given the following priorities: (1) appraisal of the living resources of the sea, including estimation of their productive capacities; (2) discovering the scientific knowledge necessary for regulating international fishing effort so as to obtain the greatest long-term value to mankind; and (3) research toward improving the resources themselves. (Food and Agriculture Organization, Rome, February 13, 1964.)

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PLANS FOR EXPLORATION OF MARINE RESOURCES URGED BY DIRECTOR-GENERAL:

Exploration of the sea and its resources "should, and eventually must be planned, if the sea is to provide the greatly increased supplies of animal protein that the world's human population needs," said the Director-General of the Food and Agriculture Organization (FAO) at the opening session of FAO's Advisory Committee on Marine Resources Research meeting held in Rome. In his speech he said that the world was now facing a fisheries revolution which should soon make it possible to farm the seas.

There were, however, three prerequisites for this, the FAO Chief continued. The first, he said, was "a detailed and quantitative knowledge of the dynamic biological processes in the sea and the pathways by which the sun's energy and the nutrients in the sea water become converted into materials of use to man." The second was "a real conquest of the sea, in the sense of a great development and application of techniques and equipment for exploiting and controlling the sea." The final prerequisite, he said, was the need for "international control of exploitation to ensure that the fruits are plucked only when they are ripe, and that seed is set aside for the future." Although still rich in unused or underutilized resources, in many cases present resources could be improved and perhaps new stocks could be created by transplantation, he said.

But in some cases there was urgent need for conservation of stocks now being overfished at the expense of long-term sustained yields. In this connection, the FAO Director-General cited the example of whale stocks in the Antarctic Ocean.

Late in 1963 fisheries scientists of many nations had recommended a drastic reduction in whaling catches to preserve whales from possible extinction. "Yet we are now in the middle of a whaling season during which yet again more whales will be taken than the present stocks can support. Results so far reported from the Antarctic this year are confirming the scientists' gloomy view of the situation," the FAO head stated. He personally has called this situation to the attention of the member countries of the International Whaling Commission.

FAO's biennial Conference, which was held in Rome November 16-December 5, 1963, called for a reappraisal of the program of the Organization's Fisheries Division, with particular reference to its work in marine resources. "This reappraisal could lead to new measures which could make this Organization in future years the leading intergovernmental body in encouraging rational harvesting of food from the oceans," the Director-General said. He concluded his address at the opening session of the Advisory Committee meeting by calling on the Committee to assist FAO in carrying out that task.

The FAO Advisory Committee on Marine Resources Research is made up of 15 outstanding fisheries scientists from 11 countries, appointed for one-year terms by the Director-General. The Committee also acts as the advisory group on oceanographic aspects of fisheries to the Inter-Governmental Oceanographic Commission under the United Nations Education, Scientific and Cultural Organization, (Food and Agriculture Organization, Rome, February 6, 1964.)

* * * * *

WORLD FISH RESOURCES MUST BE MORE WISELY MANAGED:

The lack of wise management of the world's fisheries resources seriously restricts man's ability to reap a maximum harvest from the sea, warned Dr. D. B. Finn, former Director of the Fisheries Division of the Food and Agriculture Organization (FAO). He blamed this situation on the intense competitiveness of private fisheries enterprises and the inability of governments to agree on a common code of discipline in exploiting the oceans.

Dr. Finn, who retired from his FAO post on January 31, 1964, after 18 years as head of that Division, was asked to speak in his personal capacity at the FAO Advisory Committee on Marine Resources Research meeting held in Rome in February 1964. "The failure of the International Whaling Convention, particularly as it affected the survival of the blue whale, is one example," he said. "The result is that the blue whale is now economically extinct. It seems to me that the world is now on its way to this state of affairs at a rapidly increasing pace," he continued.

International (Contd.):

At the International Whaling Convention meeting held in 1963, member nations were unable to agree upon restricting whaling catches in order to preserve whales from possible extinction. The pressures put upon governments by industrial fishing combines were alleged to be the usual cause of such failures. Dr. Finn said, "This is because industrial combines in any one country result in more effective political pressure in gaining government concessions. Numerous small individual enterprises in the same country cannot effectively exert this kind of pressure. Private enterprise in fishing tends to become more oligopolistic, if not outright monopolistic. Although this may increase efficiency and make possible a better use of capital, it does nothing to relieve the competition between countries for the spoils of the chase. In fact, it may make it worse. Nor does increased efficiency in catching per se do anything to produce wiser cropping or to achieve the maximum yield. Under such regimes, the yield of the sea may be far below its potential production. Eventually only the most efficient private expeditions will be able to make fishing pay. This is not necessarily true for state-operated expeditions which may be able to disregard costs as a matter of government policy."

Another problem, Dr. Finn continued, was the sheer number of organizations engaged in fisheries research. "Look at the many international groups now working at this task. . . . With such multiplicity, one can imagine what a tremendous task it would be to achieve a 'smooth co-ordination of effort.'"

Dr. Finn said FAO's Fisheries Division, despite its qualified and efficient personnel, was not equipped to carry out all the work the world expects of it. He said that man now has the scientific know-how to truly farm the sea and that world fishing faced a renaissance such as occurred during the agricultural revolution 100 years ago. Reduced to its simplest terms, world fishing has two elements--the nature of fishing itself, and the living resource and its response to man's exploitation. Describing the first, he said, "modern fishing is a fiercely competitive hunt. The hunters, and their skills, increase daily." On the second point, he said there was an urgent need for more knowledge of just what the seas' resources are and their likely response to different intensities of fishing. "Until we can say more about this, it is very unlikely that the arguments for wise exploitation will be very convincing. It is here that the challenge lies for the fisheries scientists; it is here where the greatest urgency prevails." (Food and Agriculture Organization, Rome, February 7, 1964.)

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FISHERIES DIVISION DIRECTOR RETIRES:

The Director, Dr. D. B. Finn, of the Fisheries Division of the Food and Agriculture Organization (FAO), retired from that organization of January 31, 1964, after 18 years of service. When appointed to FAO, Dr. Finn was Canada's Deputy Minister of Fisheries, a post he had held since 1940.

The Deputy Director-General of FAO, speaking in the absence of the Organization's head, said that Dr. Finn in his capacity of FAO's Fisheries Director "has become known all over the world, and his leadership has gained him an international reputation." Dr. Finn, he said, had built the Fisheries Division from its inception to its present strength,

"not only the Division at headquarters, but also the Fisheries Regional establishments, the Fisheries Councils in the different regions, and a wide range of technical assistance and Special Fund activities..." He had initiated the many publications on fisheries which had gained world-wide recognition and "his name will always remain a part of the history of FAO," he said.

* * * * *

NEW DIRECTOR OF FISHERIES DIVISION APPOINTED:

Roy I. Jackson of the United States has been appointed Director of the Fisheries Division of the Food and Agriculture Organization (FAO), to succeed Dr. D. B. Finn of Canada, who retired in January 1964 after 18 years as FAO Director of Fisheries. The appointment will be effective on May 1, 1964.

Jackson is a resident of New Westminster, British Columbia, Canada, where he has, since 1955, been Executive Director of the International North Pacific Fisheries Commission at Vancouver. Prior to that he was a biologist and engineer with and later Assistant Director of the International Pacific Salmon Fisheries Commission at New Westminster.

He attended the University of Washington and received his bachelor of science degree in 1939 after specializing in fisheries biology and engineering. After graduate study and work as a fisheries biologist and fisheries engineer, he took the degree of Bachelor of Applied Science in Civil Engineering at the University of British Columbia, Vancouver, in 1948. Jackson is a Fellow of the American Institute of Fishery Research Biologists and a former member of the Association of Professional Engineers of British Columbia. (Food and Agriculture Organization, Rome, February 26, 1964.)

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EXPERTS SEEK WORLDWIDE STANDARDS FOR FISHERY PRODUCTS IN INTERNATIONAL TRADE:

Experts from 12 countries met in Rome February 18-20, 1964, to begin work on worldwide standards and a code of principles for fishery products in international trade. The meeting was concerned primarily with tuna canned in oil, sardines canned in oil, herring canned in tomato sauce, and frozen tuna. The work is part of that being carried out under

International (Contd.):

the Codex Alimentarius Commission established in 1962 by the Food and Agriculture Organization and the World Health Organization of the United Nations.

In 1957, fishery exports absorbed 1 out of every 4 tons of fish landed. In 1961, that ratio of fish or fish products going into international trade had grown to 1 out of 3 tons landed.

Each major fishing country already has established food laws, regulations, and quality standards for its products. The job now facing world fisheries experts is to prepare a commonly-accepted international instrument. (Food and Agriculture Organization, Rome, February 11, 1964.)

GREAT LAKES FISHERY COMMISSION

LAKE TROUT FISHING TRENDS IN LAKE SUPERIOR:

Improvements shown over the past two years in the inshore population of lake trout in Lake Superior have aroused the optimism of sport and commercial fishermen in the Great Lakes. This optimism is well founded, but it needs to be tempered with the realization that recovery of those highly-valued fish has only begun.

The lake trout population has responded sharply to the reduction of sea lamprey by increases in the average size and numbers of fish. Improvements in the abundance of larger and older fish already have led to increased spawning in certain areas, but it will be several years before a good stock of spawners is reestablished.

The Canadian lake trout fishery in Lake Superior has been so reduced that it has been difficult to assess the status of lake trout stocks. The recovery of the stocks has now made it possible for the scientists to more accurately measure the changes that are occurring in the lake trout population. Nevertheless, protection must still be given to native as well as planted trout to speed recovery of spawning stocks.

Therefore, fishery agencies in both the United States and Canada have agreed to limit the lake trout catch in their areas to the amount required for biological assessment. The true goal of the lake trout rehabilitation

program would be jeopardized if wide-scale fishing was authorized prematurely. (Source: Great Lakes Fishery Commission, February 12, 1964.)

INTERNATIONAL FEDERATION FOR THE PROGRESS OF FOOD

FIRST NUTRITIONAL CONGRESS TO BE HELD IN PARIS:

The First Congress of the International Federation for the Progress of Food (FIPAL) will be held in Paris, France, November 6-9, 1964. The Congress will be held under the sponsorship of several of France's Ministries--the Ministry of Agriculture, the Ministry for National Education, and France's Secretary of State for Information. Its theme will be "Nutritional Habits and Consumption Patterns." The FIPAL Congress will be held at the same time as the International Food Exhibition (Salon International de L'Alimentation.) Among the French firms which have applied for space are those producing frozen and canned food products. Also, applications to participate have been received from firms in the United States, German Federal Republic, Denmark, and Morocco.

Note: For details write to: SOPEXA, 121 Boulevard Haussmann, Paris 8^e, France.



INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

REGULATIONS FOR 1964 SOCKEYE SALMON FISHERY IN NORTH PACIFIC:

The tentative suggestions for regulatory control of the 1964 sockeye fishery in North Pacific Convention waters, as submitted to the fishing industry on December 18, 1963, were reconsidered in view of suggestions made by the Advisory Committee at a meeting of the Commission held on January 16, 1964.

Action taken by the Commission in view of the Committee's recommendations is as follows:

1. Representation by both United States and Canadian members of the Committee in respect to additional fishing time for chinook or spring salmon nets was considered but not acted upon at this time. It was agreed that any representation made at a later date on the

International (Contd.):

part of the national regulatory fisheries agencies regarding the need for the proper harvesting of this species, consistent with the required conservation of the sockeye salmon, would be considered favorably as provided for in Article V of the Sockeye Salmon Fisheries Convention.

2. The date for relinquishing control in a major portion of United States Convention waters lying easterly of the Angeles Point-William Head line was changed from September 20 to August 30 on the basis that there would not be sufficient gear to endanger the proper escapement of the late running races of sockeye through these waters.

3. In view of the earlier date set for relinquishing control in a major portion of United States Convention waters lying easterly of the Angeles Point-William Head line, those remaining waters lying westerly of a line projected from Iwersen's dock on Point Roberts towards Georgina light at Active Pass to the International boundary were closed from August 30 to September 20 to avoid the possibility of catching delaying sockeye drifting off the mouth of the Fraser River.

Canadian Convention Waters:

West of William Head-Angeles Point Line and East of Bonilla-Tatoosh Line:

June 28 to August 15 - Closed to all net fishing.

August 16 - Relinquish control.

East of William Head-Angeles Point Line Including Areas 17, 18, that portion of Area 19 lying easterly of the referenced line and District No. 1:

June 28 to July 11 - Closed to all net fishing except that the Area Director may authorize the use of gill nets having a mesh of not less than 8 inches extension measure for linen nets and $8\frac{1}{2}$ inches extension measure for synthetic fibre nets at such times and places that he may deem appropriate.

July 12 to September 26 - Open to net fishing 8:00 a.m. Monday to 8:00 a.m. Tuesday of each week.

September 27 - Relinquish control.

Special Troll Restrictions:

Commercial fishing by trolling shall be prohibited during the period from August 23 to September 26, except at such times that net fishing, other than with spring salmon nets, may be permitted, in any of Canadian Convention waters (Howe Sound not included) lying easterly and inside of a line projected from Gower Point at the northerly entrance to Howe Sound to Thrasher Rock light thence in a southeasterly direction to Salamanca Point on the southerly end of Galiano Island thence in a straight line to East Point on Saturna Island, thence in a straight line towards Point Roberts light to the intersection with the international boundary line thence following the international boundary line to its intersection with the mainland.

United States Convention Waters:

West of William Head-Angeles Point Line and East of Bonilla-Tatoosh Line:

June 28 to August 15 - Closed to all net fishing.

August 16 - Relinquish control.

East of William Head-Angeles Point Line:

June 28 to July 11 - Closed to all net fishing except with nets having a mesh of not less than $8\frac{1}{2}$ inches extension measure and under regulation by the Washington State Director of Fisheries.

July 12 to August 8 - Gill nets open daily 7:00 p.m. to 9:00 a.m. Monday afternoon to Wednesday morning of each week.
Purse seines and reef nets open daily 5:00 a.m. to 9:00 p.m. Monday and Tuesday of each week.

August 9 to August 29 - Gill nets open daily 7:00 p.m. to 9:00 a.m. Sunday afternoon to Tuesday morning of each week.
Purse seines and reef nets open daily 5:00 a.m. to 9:00 p.m. Monday and Tuesday of each week.

August 30 - Relinquish control except in those waters lying westerly of a line projected from Iwersen's dock on Point Roberts towards Georgina light at Active Pass to the intersection with the international boundary, said waters to remain closed until September 20.

September 20 - Relinquish control in the West Point Roberts area as defined above.

Notes: (1) Times are based on Pacific Daylight Saving Time.
(2) See Commercial Fisheries Review, December 1963 p. 51.

INTERNATIONAL COOPERATIVE INVESTIGATIONS OF THE TROPICAL ATLANTIC

PROPOSED PLANS FOR EQUALANT III:

At least 5 nations and 6 vessels will participate in EQUALANT III. A general plan involving a 15-day synoptic period of direct current measurements in an area to the east of 20° west longitude (Canary Islands) and south to 20° south latitude was developed at the July 1963 meeting in Paris of the International Coordination Group (ICG) for the International Cooperative Investigations of the Tropical Atlantic (ICITA). Schedules and general plans for EQUALANT III were approved by the Intergovernmental Oceanographic Commission (IOC) at meetings in Paris during October 1963.

Definite commitments for vessel participation were received from the Congo (Brazzaville), Ghana, Republic of Ivory Coast, Spain, and the United States. The United States vessels involved are the Pillsbury operated by the University of Miami and the Geronimo operated by the U. S. Bureau of Commercial Fisheries. Tentative commitments were received from the Soviet Union. A scientist from the Institut fur Meerskunde Universitat

International (Contd.):

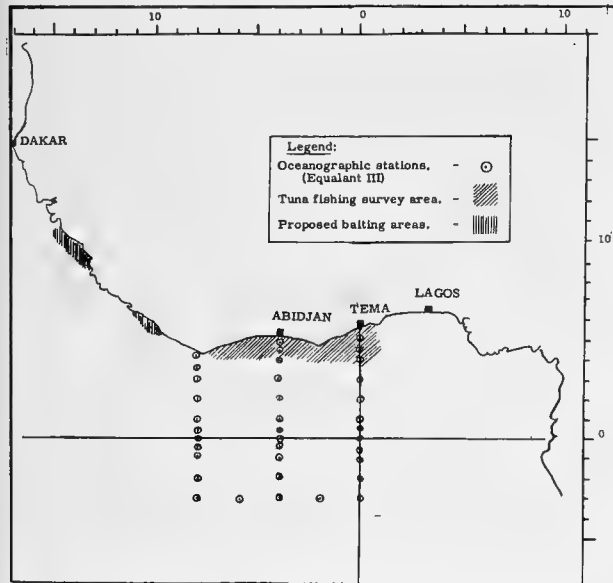
Kiel will participate on board the Geronimo during the survey.

Note: See Commercial Fisheries Review, December 1963 p. 50.

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BUREAU OF COMMERCIAL FISHERIES
RESEARCH VESSEL PARTICIPATES
IN EQUALANT III:

M/V "Geronimo" Cruise 3 - EQUALANT III (January 15-May 15, 1964): The research vessel Geronimo operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Washington, D. C., is participating in EQUALANT III of the International Cooperative Investigations of the Tropical Atlantic (ICITA) and will be conducting some additional studies during this four-months'



Proposed cruise track of M/V Geronimo Cruise 3 in Gulf of Guinea, January 15-May 15, 1964.

cruise in the Gulf of Guinea. The objectives of the cruise are: (1) participation in EQUALANT III, through a program of direct current measurements associated with hydrographic and biological sampling in the Gulf of Guinea, and (2) surveys of the distribution of schools of tuna in surface waters of the Gulf of Guinea and of related environmental factors.

On the Washington, D. C., to Dakar (January 15-February 3) part of the cruise, various oceanographic, hydrographic, biological, and weather observations are to be made; a

record is to be kept on the occurrence of fish schools, birds, and mammals observed at the sea surface; and night-light stations are to be occupied.

On the Dakar to Lagos (February 5-March 2) part of the trip, tuna survey I is to be conducted. The vessel is to proceed from Dakar to the Continental Shelf area off the coast of Sierra Leone (from latitude 9° N. to latitude 8° N.) and search for *Sardinella* (a sardine) to be used as live bait in tuna fishing. If these bait fish are not found in that locality, the vessel is to move south to the continental shelf area off Liberia and continue the search. Tuna surveys, with observations on surface schools and with live-bait fishing, are to be made during daylight hours each day. The search is to follow an "in-out" pattern with lines extending south from the 100-fathom curve for a distance of about 90 miles along the following longitudes: 7°30' W., 6°30' W., 5°30' W., 4°30' W., 3°30' W., 2°30' W., 1°30' W., 0°30' W., 0°30' E., 1°30' E., 2°30' E., 3°30' E.

Samples of tuna from a maximum number of schools are desired. Pole-and-line fishing is to be attempted on each school encountered. Jigs are to be trolled continuously during the tuna surveys. If the fish bite, fishing is to be broken off after 25 fish of each species in the school are aboard. If the fish do not come up to the vessel and start biting after 2 passes, chumming is to be broken off and the survey resumed. It is not known at what point in the survey that the initial supply of live bait may become exhausted. In the event that this does occur, an attempt is to be made to replenish the supply of bait, after which the survey will be resumed.

Upon successful sampling of tuna schools, a record is to be made of the fork length, sex, and weight of each fish; 10 ovaries from among the 25 fish caught from each school sampled are to be preserved; and stomach samples from each of the 25 fish caught from each school are also to be preserved.

Supplementary observations during the tuna surveys include oceanographic, hydrographic, and weather observations; night-light collecting as opportunity affords; and mid-water trawl samples in areas of concentration of tunas.

On the trip from Lagos to Tema (March 4-28), 37 stations will be occupied (fig.) At each

International (Contd.):

station oceanographic, hydrographic, and biological observations are to be made; a midwater trawl haul is to be made in the mixed layer; and a high speed net haul made at the surface.

From Tema to Abidjan (March 30-April 22), tuna survey II is to be a repeat of tuna survey I.

From Abidjan to Washington (April 24-May 15), the same observations are to be made as those during the trip from Washington to Dakar.

Note: See Commercial Fisheries Review, June 1963 p. 56.

NORTH PACIFIC FUR SEAL COMMISSION

CONVENES IN MOSCOW FOR ANNUAL MEETING:

The annual meeting of the North Pacific Fur Seal Commission convened in Moscow on February 24, 1964, with the four governments which are Parties to the Interim Convention on Conservation of North Pacific Fur Seals participating. The United States delegation was composed of representatives from the U. S. Department of the Interior, the Department of State, and the State of Alaska. Other delegations were from Canada, Japan, and the Soviet Union.

When those four countries first agreed to conserve the fur seal in 1911, the seal was well on the way to virtual extinction. Since then the seal herd on the Pribilof Islands, off Alaska, has grown from a low of 134,000 to about 1.5 million animals. Because the fur seal is migratory, living both on land and ranging far at sea, special problems in conservation occur. The Fur Seal Treaty of 1911 prohibited harvesting the animal at sea and provided for the sharing of the land-based harvest with those sealing on the open sea.

Japan withdrew from the first treaty in 1941. From 1942 to 1957, the Pribilof seal herd was protected by a provisional agreement between Canada and the United States. A new North Pacific Fur Seal Convention was concluded in 1957 by the original four countries. Under that Convention, Japan and Canada each receive 15 percent of the annual separate harvests of the United States and the U.S.S.R., and carry out extensive research under plans approved yearly by the Fur Seal Commission.

One of the research problems now being considered by the Commission is whether harvesting at sea in conjunction with land sealing could be permitted in certain circumstances without jeopardizing maximum sustained harvests. Much has been learned in recent years about migration, mortality, reproduction, feeding, diseases, and many other factors affecting the seal herds.

A significant feature of fur-seal behavior is that the bull seals or "harem masters" and the cow seals arrive on the islands at different times. The bachelor seals--those under 6 or 7 years of age--arrive even later, and live apart from the harems. This fact has long been used to advantage in land harvesting. Other research concerns the role of the seal as predators of other sea creatures. Studies are being made of what seals eat, and how, and how far they can range from the breeding grounds to find food. The research programs are worked out so that the research of one country supplements that done by the other countries.

Fur seals of the Pribilof Islands are managed and harvested by the Bureau of Commercial Fisheries, U. S. Department of the Interior. Biologists study the seals to learn their characteristics and life habits, and from 50,000 to 60,000 processed seal pelts are sold each year for the account of the United States Government. The fur seal is very different from other types of seals and apart from its intrinsic value as a unique species, it is also valuable as an economic resource. The seals harvested by the United States Government on the Pribilof Islands have brought more than \$25 million to the Federal Treasury. The fur is among one of the most valuable in the world.

Note: See Commercial Fisheries Review, December 1963 p. 52, January 1963 p. 74.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

FISHERIES COMMITTEE MEETING HELD:

The Fisheries Committee of the Organization for Economic Cooperation and Development (OECD) met on February 10-12, 1964. The Committee considered subsidies and other financial support given to fishing industries in member countries. It also considered a report on price systems in the fishing industries of Norway and Germany, and a report on the general services rendered to the fishing industry by the Government in Germany. (OECD Activities, February 1, 1964.)

International (Contd.):

WHALING

OUTLOOK FOR 1963/64

ANTARCTIC SEASON:

The 1963/64 International Antarctic whaling season opened on December 12, 1963, with factoryships and fleets of catcher vessels from Japan, the Soviet Union, Norway, and the Netherlands participating. The whale hunting season ends April 7, 1964, and predictions were that by that time fewer whales will have been caught than in the previous season. The 1962/63 season's catch was below the previous season's partly because there were fewer expeditions. Also, for the first time in many years, no whaling was done from Antarctic land stations at South Georgia. But aside from that, scientific findings point to a continued serious decline in the Antarctic population of several species, particularly the finwhale and the blue and humpback species.

The Fifteenth Annual Meeting of the International Whaling Commission (IWC) held in London, in July 1963, was opened on a serious note by the Parliamentary Under Secretary of State for Scotland. In whaling, as in wars, he said, it was easier to invent efficient means of destruction than to exercise self-discipline and devise the necessary international agreements to keep such power in control. The IWC had arranged an independent investigation by a committee of three scientists and he said that committee had produced evidence of a serious whale stock decline. The committee scientists were from the United States and New Zealand and included the Chief of the Biology Branch of the Fisheries Division of the Food and Agriculture Organization of the United Nations (FAO). The three scientists worked with the IWC's Scientific Committee to analyze a large collection of biological data plus whale catch statistics for the past 30 years.

The most recent catch figures showed that 21 Antarctic expeditions during the 1961/62 season caught 15,252 "blue-whale units" compared with only 11,300 units caught by 17 expeditions in the 1962/63 season. In those last two seasons, the Antarctic blue-whale catch dropped from 1,118 to 947 units, the humpback catch from 309 to 270, and the finwhale catch from 26,438 to 18,668. Meanwhile, the 1962/63 figures showed an increase over the previous season in the catch-

es of sperm whales and of the more plentiful but much smaller sei whale.

The total Antarctic production of baleen and sperm oil dropped from 2,001,961 barrels in the 1961/62 season to 1,524,150 barrels in 1962/63. As a comparison, regions outside the Antarctic yielded more whales and oil in 1962/63 than in the previous season.

At the meeting, the Committee of Three Scientists recommended the complete cessation of the catching of blue and humpback whales in the Antarctic for "a considerable number of years." The scientists said that to maintain the present sustainable yield of finwhales, the annual catch would have to be cut to 5,000 whales. The catch would have to be much lower even than that for a number of years if the finwhale stock was to be allowed to increase in numbers to the extent that it would eventually yield a maximum sustainable catch of about 20,000 whales annually. The scientists also predicted that in 1963/64 the same 17 expeditions which participated last season would only be able to catch about 16,000 finwhales (9,000 blue-whale units, including sei and pygmy blues), and in doing so they would reduce the stock drastically.

The 16 contracting countries of the Commission voted for complete protection of humpback whales south of the equator. These countries also instituted complete protection for the blue whale except in an area mainly inhabited by a smaller race called the pygmy blue. In addition, an agreement between the 5 (now 4 because the United Kingdom dropped out) Antarctic pelagic whaling countries about catch inspection was brought to a near-final stage.

But the Commission members disagreed widely on the question of reducing the total catch limit. The limit for some years had been 15,000 blue-whale units. (One blue-whale unit equals 2 finwhales, 2½ humpbacks, or 6 sei whales). Finally, the decision was taken to reduce the quota to 10,000 units. Most of that quota would be finwhales. To reach the quota, about 16,000 finwhales would have to be caught.

In September 1963, the decision brought a reaction from the Director-General of the Food and Agriculture Organization. In a letter from FAO's Rome headquarters to the Commission Secretary, he complimented the

International (Contd.):

Commission on its new protection regulation for humpback and blue whales. But he called the quota reduction "completely ineffective as a conservation measure" for finwhales. His letter continued, "Any serious attempt to reach the new quota will further reduce the stock of finwhales and delay the time when, even by the application of stringent conservation measures, those stocks can be rebuilt to a level at which they can sustain economic yields." The FAO Director-General asked the Commission Secretary to convey an appeal to Commission member countries "to adopt, during the forthcoming Antarctic whaling season, a policy of voluntary restraint in the catching of finwhales so that the total catch of that species should not exceed 5,000 whales." He said that he considered it his duty to take such action because FAO had a basic constitutional responsibility to promote and recommend national and international actions toward conservation. "I am making this appeal," he said, "because of the need for preventing further and perhaps irreparable damage to the whale stocks." As of February 1964 there had been no official recognition of the appeal from the whaling countries. But in November 1963, the FAO governing Conference expressed its grave concern about the problem and endorsed the Director-General's appeal.

The 1963/64 whaling season could well be the most crucial in the history of Antarctic whaling. (Food and Agriculture Organization, Rome, February 21, 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 38, January 1964 p. 41, and August 1963 p. 78.



Australia

TUNA LONG-LINING SURVEY:

It is doubtful if Australian fishermen can undertake offshore tuna long-line fishing on a year-round basis unless there is a substantial change in the present cost/price relationship of the Australian tuna fishery. That conclusion was reached by a three-man investigating team of senior Australian Government officials which visited Japan, Hawaii, and American Samoa in 1963 to examine vessels, gear, and technical developments in the long-line industry. The visit was part of the Government program to develop tuna resources

in waters adjacent to Australia, particularly in the Tasman Sea.

The mission's report, released in late 1963, recommends that consideration be given to the development of modified tuna long-line methods suitable for part-time use by Australian fishing vessels. A vessel designed for pole-and-line fishing may not be suitable for full-scale long-lining but there is a possibility of using modified long-line gear, according to the report.

The Australian catch of tuna is about 5,000 short tons a year, consisting almost entirely of southern bluefin tuna caught by the pole-and-line fishing method in two areas--off the southern coast of New South Wales, and off the South Australian coast, near Port Lincoln. Most of the New South Wales tuna catch is taken from October to December whereas most of the South Australian catch is taken from January to April. Some of the larger tuna vessels operate in the fishery in both areas.

The seasonal nature and uncertainties of the present Australian tuna fishery result in unsatisfactory features both for the fishermen and the processors.

The report points out that local processors have had no problem in disposing of tuna supplied by Australian fishermen. Some frozen raw tuna has been exported to the United States, but most of the supply has been canned and sold in Australia. There are good indications that the Australian tuna market can absorb larger quantities.

However, any major development of the Australian tuna industry needs to include untapped deep-sea stocks which require new fishing methods. This situation led to the investigation of long-line gear.

In Japan, an Australian study group surveyed many tuna long-line vessels and selected four for detailed study. The vessels studied ranged in size from 112 to 495 gross tons. Crew accommodations on the vessels did not match average Australian facilities. Deck heads were too low for Australian crews, and the engine room and machinery spaces appeared to be too cramped to meet Australian regulations.

Estimates were made of the construction costs of such vessels built in Japan, but modi-

Australia (Contd.):

fied to comply with Australian specifications. The estimates did not include the cost of the actual long-line fishing equipment.

Data on the Japanese long-line tuna catch in waters off the east coast of Australia were obtained. The data indicate that the tuna resource in those waters will sustain year-round deep-sea long-lining.

But detailed calculations for operating 4 long-line vessels from east Australian ports by Australian fishermen indicate that at the prevailing Australian ex-vessel price of £A50 (US\$111) per short ton, annual losses would be considerable.

The ex-vessel price for tuna in Japan is considerably above that in Australia. On the other hand, the Japanese have lower operating costs. The outlook for reducing estimated Australian long-line costs by additional mechanization is not favorable.

The study concluded that Australian fishermen would not be able to operate profitably in the tuna long-line fishery on a year-round basis unless there is some very substantial change in the present cost/price relationship of the Australian tuna fishery. It was suggested that consideration be given towards developing modified long-line gear and methods suitable for part-time use by Australian fishing vessels. (Australian Fisheries Newsletter, December 1963.)

Note: See Commercial Fisheries Review, October 1963 p. 44.

**Bulgaria****PLANS FOR FISHING FLEET:**

Rabotnichesko Delo on February 14, 1964, published an interview with a Bulgarian Academy of Sciences corresponding-member who discussed Bulgarian high-seas fisheries plans. He said that Bulgaria was less fortunately situated than the Soviet Union and Turkey for Black Sea fishing and had decided to "turn to the unlimited fish stocks of the oceans where everyone fishes who has a fishing fleet." He said that Bulgaria would first try fishing around Iceland, Newfoundland, and the West Coast of Africa. Later, trips to the Indian Ocean were "highly probable." He indicated that Bulgarian efforts to develop

an offshore fleet would depend to some extent on Soviet cooperation and assistance. (United States Legation, Sofia, February 19, 1964.)

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HIGH-SEAS FISHERIES DEVELOPMENT AIDED BY SOVIETS:

An agreement under which the Soviet Union will help Bulgaria to develop her high-seas fishery was signed in Moscow early this year by the Bulgarian and Soviet Ministers of Foreign Trade, according to a Bulgarian central press announcement on January 25, 1964.

Under the agreement the Soviet Union will turn over to Bulgaria by the end of 1964, one trawler equipped to catch 4,000 to 5,000 metric tons of fish on the high seas each year. By the end of 1970, the Soviet Union is to deliver another 19 such trawlers to Bulgaria, as well as 4 refrigerator vessels. This fleet of vessels is expected to bring the Bulgarian fishery catch up to the target of 100,000 tons annually set in the 20-year plan. The number of persons employed in high-seas fisheries will be about 1,500 to 1,600, which is the number now employed in the river, Black Sea, and pond fisheries of Bulgaria.

Because of the additional capital to be used and the good prospects envisaged, high-seas fisheries production is expected to be ten times greater than that of the Bulgarian river, Black Sea, and pond fisheries. It is expected that the 20 trawlers will remain on the fishing grounds for periods of from 3 to 6 months during which time each vessel will catch 25 to 30 tons of fish a day. The fish will be washed mechanically, frozen, and stored on the trawler. About every two weeks, a refrigerator vessel will take the frozen fish from 4 or 5 trawlers and bring it to port. (United States Legation, Sofia, January 29, 1964.)

**Canada****NEW SMOKED FISH REGULATIONS:**

In late 1963, the Fish Inspection Regulations of Canada were amended to require that smoked fish in any container sealed to exclude air, such as plastic envelopes or cans, must be heat processed after sealing at the temperature and for the time normally used for sterilizing canned fish products. (The new regulation does not apply to unpackaged smoked fish

Canada (Contd.):

or to smoked fish in a loose wrapper not sealed.)

As a temporary alternative, short-term regulations remaining in effect only until April 30, 1964, provide that smoked fish may be packed in containers sealed to exclude air, such as plastic envelopes or cans, provided that it is frozen immediately after packaging and kept frozen through all stages of distribution from processing through the wholesalers and retailers to the consumers. Frozen, vacuum-packed, smoked fish packed before April 30, 1964, under the temporary provision, must bear on the main panel of the container, prominently displayed and in lettering not less than one-quarter inch high, the words "Keep Frozen."

The new regulations apply equally to all vacuum-packed smoked fish in Canada which has been imported. If the product to be imported has been heat processed, in accordance with the first part of the regulations described above, details of the heat processing must be made available to the Canadian Department of Fisheries before entry of the shipment will be permitted. (Canadian Trade News, November-December 1963.)

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BRITISH COLUMBIA SHUCKED OYSTER PRODUCTION, 1963:

British Columbia production of shucked oysters in 1963 was 70 percent above that in 1962.

| Liquid Measure | 1/1963 | 2/1962 |
|----------------------------|---------|-----------|
| 8-oz. | 427,054 | { 411,235 |
| 12-oz. | 31,891 | |
| 16-oz. | 14,763 | { 20,503 |
| 20-oz. | 6,461 | |
| 32-oz. | 74,364 | { 75,462 |
| 40-oz. | 8,319 | |
| 128-oz. | 112,870 | 50,061 |
| Total in gallons | 170,375 | 100,343 |

1/Preliminary.

2/Revised.

Note: A more detailed unit breakdown of British Columbia oyster production became available in 1963.

Prices paid by wholesale distributors in British Columbia for oyster meats in December 1963 were as follows: half-pints, C\$0.30-0.35; pints, \$0.53-0.75; quarts, \$0.90-1.15; and gallons, \$3.00-4.50 (bulk oyster meats

were available at a slightly lower rate per gallon).

Note: See Commercial Fisheries Review, March 1963 p. 51.



Chile

ANCHOVETA REAPPEAR OFF NORTHERN CHILE:

After an almost complete absence of six months, anchoveta reappeared in the coastal waters of northern Chile on December 6, 1963. Many of the fish-meal plants were caught unprepared, and fish-holding bins were well filled while the reduction factories prepared for processing.

When the fish first reappeared, the landings contained a high percentage of small fish and the protein content of the meal dropped sharply. Landings in December 1963 were about the same as those in the same month of 1962, but the total anchoveta catch in 1963 fell far short of anticipation.

In January 1964, the anchoveta returned to normal size and were taken in greater quantity than in January 1963. All plants were operating on a 24-hour schedule at maximum capacity. Several new fish-meal plants will go into production during the first quarter of 1964. This should restore the balance between fleet and plant capacity in northern Chile.

The Chilean Fisheries Development Institute became operative January 1, 1964. The institution will provide technical information needed for accelerated development and rational exploitation of Chile's fishery resources. (United States Embassy, Santiago, January 23, 1964.)



Communist China

FISHERIES TRENDS:

Communist China was the third largest fishing nation of the world in 1962 with an estimated annual catch of 5 million metric tons, according to the Food and Agriculture Organization (FAO) of the United Nations. The Australian Fisheries Newsletter, December 1963, reported the following description of the fishing industry in Communist China:

Communist China (Contd.):

China is rich in fish resources with an 8,700-mile coastline and numerous good harbors. The main coastal waters--Po Hai Bay, the Yellow Sea, the East China Sea, and the South China Sea--contain more than 1,000 marine species of economic value, including yellow croakers, "hairtails," herring, bream, globefish, eels, sharks, and mackerel. Shrimp are abundant, especially in the Yellow Sea and Po Hai Bay. In addition, clams, oysters, scallops, mussels, squid, and other shellfish are caught in large quantities.

The Government has put considerable effort into developing marine fisheries, which normally account for about 60 percent of the country's annual fish catch.

Some of the leading fishing ports are Lushun (Port Arthur), Chingtao (Tsingtao), Yantai (Chefoo), and Shanghai. Motorized junks are being built, and motors are being installed on sail boats. Some new fishing harbors have been built, some of which have multiple facilities to supply mechanized junks and trawlers, and to process their catch. There are also some refrigerated carrier vessels in use. It has been reported that communes are now responsible for 80 percent of national fish production.

For rapid training, short courses are provided to instruct fishing crews. In some cases, the training is carried out aboard a vessel, the apprentices learning under experienced crew members while helping with the work. In Chekiang Province, a leading fishing area, more than 3,000 fishermen are reported to have been trained since 1956.



Denmark

FISHERIES TRENDS:

February 1964: Fishing Limits: Danish fishery organizations have asked their Government to ratify the convention establishing a 12-mile fisheries limit which was expected to be agreed upon at the West European Fisheries Conference which reconvened in London, February 26, 1964. Qualifications would permit countries with traditional fishing rights to continue to fish up to 6 miles offshore (or possibly 3 miles for a shorter period).

Export Market Promotion: Although exports of Danish fishery products set a new record for both quantity and value in 1963, the industry is concerned because prices declined for the substantial exports of herring products. Costs in general are increasing while prices are not. Exports to the Soviet Bloc countries decreased in 1963.

It is generally agreed that only market promotion will make possible a continued increase in fishery trade at a profit. But there is disagreement as to how such a program should be financed and carried out.

The Danish Fishery Exporters Association has begun a market promotion program, primarily for exports, to be financed by its members and others who would benefit from increased trade. Efforts will be made to increase present markets, sell higher-priced fish in the Middle East, and expand the Austrian market. Slogans will be developed for use in three languages. Quality will be stressed. In addition, aid will be sought from the Agriculture Marketing Committee which has a fine record in marketing food products on a worldwide basis.

To help cultivate the United States market, the Danish Government will refill the fisheries attache post in New York City and may sponsor a Danish Fish Week at the Danish pavilion at the New York Worlds Fair. The Danish Fisheries Ministry has only limited funds for market promotion.

Herring Marketing Problems: Danish and Swedish herring fishermen and exporters and West German importers reached no final solution to the 1963 season's herring marketing problems. The difficulties were discussed in early February 1963 at a meeting in Copenhagen called by Denmark's Fishery Exporters Association. Herring landings for food were heavy in Denmark in 1963, and about 70 percent of the supply was landed by Swedish cutters. Prices in West Germany were much lower than in 1962. Catch limits were instituted but did not work well, in part, because Swedish cutters unloaded their limits in Denmark and then took the balance to West Germany, further depressing prices. At the February meeting it was agreed that the Danish and Swedish fishermen must cooperate in seeking limits on catches, and must eventually establish minimum price regulations for herring. Both must meet the needs of the West German importers. The problems will be further discussed at another meeting which will probably be held in Germany in April 1964.

Herring Catch Forecasts: According to Danish herring biologists, the 1964 herring season will be based on the 1962 year class and is expected to be normal--better than in 1963.

Norwegian biologists predict an abundance of herring in the Skagerrak Sea during the next few years. Danish herring meal and oil producers are considering the forecast, and may expand production facilities in that area.

Danish-Polish Relations: Poland has expressed dissatisfaction with the exclusion of its fishing vessels from Greenland waters within 12 miles of shore. (The Polish vessels had not established traditional fishing rights when Greenland's 12-mile fishing limits were established.) The Polish Vice Minister for Navigation and Fisheries visited Denmark February 5-9, 1964. Although Poland and Denmark have some mutual interests in Eastern Baltic Sea fishing, the Vice Minister's primary interest was in having the ban in Greenland lifted. The Danish response was that Poland could not be accommodated without doing the same for other countries. Since the latter was not possible, the status quo must continue.

In February 1964 a Danish shipyard in Odense obtained a contract to build a fish-freezer mothership for Poland. The 5,000-ton steel vessel will be designed to take catches from trawlers in the open sea. It will be strengthened for navigating in ice-filled waters. The contract seems somewhat unusual since Poland has shipyards in Gdansk and Gdynia which are building similar vessels for both the Polish and the Soviet fishing fleets. Provisions in the Danish-Polish trade agreement for ship construction in Denmark are said to be responsible for the contract. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 19, 1964.)

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Denmark (Contd.):

January-September 1963: Landings of fish and shellfish at Danish ports by Danish fishing vessels during the first 9 months of 1963 were 12 percent greater than in the same period of 1962, which was a record year for Denmark's annual fishery landings.

| Species | Jan.- Sept. 1/ | Jan.- Sept. | Jan.- Dec. |
|--|-------------------|----------------|----------------|
| | 1963 | 1962 | 1962 |
| (Metric Tons)..... | | | |
| Landings in Denmark by Danish Vessels: | | | |
| Salt-Water Fish: | | | |
| Flatfish | 52,072 | 41,100 | 65,600 |
| Cod | 54,867 | 48,200 | 62,904 |
| Herring | 203,368 | 196,100 | 260,769 |
| Other salt-water fish 2/ | 310,995 | 275,800 | 350,942 |
| Total salt-water fish | 621,302 | 561,200 | 740,215 |
| Fresh-Water Fish and Shellfish: | | | |
| Pond trout | 5,766 | 5,700 | 7,838 |
| Fresh-water fish | 2,714 | 2,500 | 4,296 |
| Mussels & starfish | 8,994 | 10,800 | 20,671 |
| Shrimp, lobsters, etc.. | 5,457 | 5,100 | 6,335 |
| Total fresh-water fish and shellfish | 22,931 | 24,100 | 39,140 |
| Total fish and shellfish | 644,233 | 585,300 | 779,355 |
| Landings in Denmark by Foreign Vessels | 93,581 | 77,000 | 107,463 |
| Danish Landings in Foreign Ports of: | | | |
| United Kingdom, Sweden, & Netherlands | 3,884 | 5,500 | 7,443 |
| 1/Preliminary data from Ministry of Fisheries. | | | |
| 2/Mainly industrial fish for fish meal and oil, ensilage, trout food, and fur-animal food; 1963 total includes estimated 140,000 tons of sand eels, 45,000 tons Norway port, and 40,000 tons of whiting. | | | |

Flatfish landings in the first 9 months of 1963 were mostly plaice and well ahead of the same period in 1962. But the cold winter cut down common sole catches sharply. Cod landings were relatively heavy and affected by the cold winter only in the Baltic Sea. Landings of herring were slightly ahead of the previous year but only an ordinary annual total was forecast by biologists. "Other salt-water fish" landings were primarily industrial fish. Catches of sand eels and whiting were very good but Norway pout landings were down. Pond trout production, despite the hard winter, was slightly better than in 1962. Most of the total for "shrimp, lobsters, etc." consisted of deep-water shrimp. Landings of Norway lobsters were lower than in 1962 because of the cold winter. (Regional Fisheries Attache for Europe, Copenhagen, January 29, 1964.)

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1963: The Danish fishing industry during the last half of 1963 continued at the same pace as in the first six months of the year and set a new record in landings and exports. Denmark's fishery landings (by Danish vessels and foreign vessels in Danish ports) in all of 1963 were 6 percent greater than the previous year. In 1963, Danish fishing vessels landed 821,127 metric tons of fish at

Danish ports; an additional 143,322 tons were landed at Danish ports by foreign vessels. The 1963 landings of plaice, cod, whiting, and sand eels were at a new high and pond trout production was greater than in 1962.

| Species | 1/1963 | 1962 |
|---|--------------------------|----------------|
| | (Metric Tons)..... | |
| Flatfish 2/ | 67,561 | 65,600 |
| Cod | 67,257 | 62,904 |
| Herring | 283,612 | 260,769 |
| Brisling | 9,153 | 12,131 |
| Mackerel | 7,098 | 7,127 |
| Hornfish | 1,989 | 2,718 |
| Other salt-water fish 3/ | 349,761 | 328,966 |
| Eels | 3,979 | 3,907 |
| Pond trout | 7,882 | 7,838 |
| Fresh-water fish | 1,210 | 389 |
| Mussels | 13,575 | 18,352 |
| Starfish | 1,767 | 2,319 |
| Shrimp, lobster, etc. | 6,283 | 6,335 |
| Total | 821,127 | 779,355 |
| Landings in Denmark by foreign vessels | 143,322 | 107,463 |
| Danish Landings in Foreign Ports of: | | |
| United Kingdom, Sweden, Netherlands, Norway, West Germany | 4,069 | 7,443 |
| 1/Preliminary data from Ministry of Fisheries. | | |
| 2/Plaice, dabs, and flounders. | | |
| 3/Mainly industrial fish for fish meal and oil, ensilage, and trout and fur-animal feeding. | | |

Prices for industrial fish during 1963 remained at the same level as in 1962, but food fish prices averaged lower because of a drop in prices for herring. It was generally admitted that most fishermen had a good year in 1963.

Denmark's exports of fishery products and byproducts also reached new levels in 1963--351,000 metric tons valued at 615 million kroner (US\$89.2 million). This was an increase of 10 percent in quantity and 4 percent in value from 1962. But exports to the United States--mostly pond trout, cod fillets, Norway lobster, and canned herring--declined more than one-third both in quantity and value. This was partly because of better markets for those products in European countries. At the end of the year, Danish exporters were complaining of keener competition, lower prices, and the need for more market promotion. A Fisheries Ministry official told Danish marketers that they should consider combining their businesses in order to gain the financial and marketing advantages enjoyed by their larger foreign competitors.

Minimum prices and minimum sizes for both plaice and Norway lobsters were subjects of great interest during 1963, but solutions were left for further study in 1964. Efforts to

Denmark (Contd.):

make fish sorting uniform in the various ports also got under way during the year.

The Soviet Fisheries Minister returned the Danish Fisheries Minister's visit to the Soviet Union during 1963 when he toured Denmark and the Faroe Islands. No further headway was made by Denmark toward gaining a market in the U.S.S.R. for canned fish, fish meal, and frozen herring. The Soviet Minister's request that Soviet vessels be per-

FISHERY PRODUCTS EXPORTS, JANUARY-SEPTEMBER 1963:

Exports to All Countries: Denmark's exports of fishery products and byproducts to all countries in the first 9 months of 1963 set new records in both quantity and value (table). All of the major categories except processed fish were up in quantity exported. Exports of fish meal, solubles, and other fishery byproducts for the period, while up 16 percent in quantity, dropped only slightly in value. Exports of flatfish, herring, and cod fillets were up substantially, but the greater quantity of

Danish Exports of Fishery Products and Byproducts, January-September 1963 and Year 1962

| Products | January-September | | | | Percentage Change from 1962 | | Calendar Year 2/1962 | | |
|---------------------------|-------------------|----------------|---------------|------------|-----------------------------|----------------|----------------------|---------------|-------|
| | 1/1963 | | | Quantity | Value | Quantity | Value | 2/1962 | |
| | Quantity | Value | | | | | | Quantity | Value |
| | Metric Tons | 1,000 Kr. | US\$1,000 | % | % | Metric Tons | 1,000 Kr. | US\$1,000 | |
| To all Countries: | | | | | | | | | |
| Fresh fish | 140,700 | 222,800 | 32,306 | +10 | +1 | 179,500 | 312,000 | 45,240 | |
| Frozen fish | 32,500 | 104,400 | 15,138 | +24 | +18 | 39,600 | 132,500 | 19,212 | |
| Processed fish | 11,200 | 50,100 | 7,265 | -7 | +9 | 19,500 | 73,500 | 10,658 | |
| Fish meal, solubles, etc. | 55,100 | 50,200 | 7,279 | +16 | -1 | 63,900 | 66,400 | 9,628 | |
| Total | 239,500 | 427,500 | 61,988 | +12 | +5 | 302,500 | 584,400 | 84,738 | |
| Fish oils | 15,600 | 13,300 | 1,929 | +42 | +64 | 15,200 | 10,600 | 1,537 | |

1/Preliminary data from the Ministry of Fisheries.
2/Record year for quantity and value.
Note: One Danish kroner equals US\$0.145.

mitted to transfer their catches in the 6- to 12-mile zone off the Faroe Islands after the 12-mile fisheries limit became effective in March 1964 was refused.

Record Faroese exports of fishery products in 1963 amounted to 134 million kroner (\$19.4 million). They constituted 98 percent of all exports and were 8 percent greater than in 1962. The most important exports on the basis of value were: wet salted fish 53.2 million kroner (\$7.7 million); dry salted fish 31.5 million kroner (\$4.6 million); iced fish 19.4 million kroner (\$2.8 million); frozen fish 11.9 million kroner (\$1.7 million); and salted herring 11.7 million kroner (\$1.7 million).

Greenland's 1963 cod catch dropped more than one-third from the previous year but salmon landings were higher. The new fish-processing plant at Godthaab (financed by Danish, Faroese, and Greenland interests) operated far below capacity during the year. Negotiations are under way with fishermen from Norway, Denmark, and the Faroe Islands to land fish at Godthaab and to train Greenlanders as fishermen. (United States Embassy, Copenhagen, January 31, and Regional Fisheries Attache for Europe, February 12, 1964.)

herring exported was down in value from the previous year because of lower prices.

Exports to the United States: Denmark's exports of fishery products and byproducts to the United States in the first nine months of

| Product | Danish Fishery Products Exports to the United States by Species and Product, January-September 1963 and Change from 1962 | | | | | | | |
|--------------------------------|--|---------------|--------------|-----------------------------|-------------|---------------|---------------|------------------|
| | 1963 | | | Percentage Change from 1962 | | 1962 | | |
| | January-September | | US\$ 1,000 | Qty. | Value | Qty. | Value | January-December |
| Metric Tons | 1,000 Kr. | Metric Tons | | | | | | 1,000 Kr. |
| Fresh and Frozen: | | | | | | | | |
| Pond trout | 562 | 4,399 | 638 | -5 | -2 | 869 | 7,377 | 1,070 |
| Other trout & salmon | - | - | - | 2/ | 2/ | 58 | 525 | 76 |
| Trout eggs | 1 | 67 | 10 | -18 | -18 | 1 | 84 | 12 |
| Flatfish | 110 | 650 | 94 | -30 | -48 | 226 | 1,666 | 242 |
| Fillets: | | | | | | | | |
| Flatfish | 50 | 210 | 30 | +140 | +113 | 23 | 119 | 17 |
| Cod | 4,484 | 13,901 | 2,016 | +5 | +7 | 7,903 | 24,506 | 3,553 |
| Herring | - | - | - | 3/ | 3/ | 5 | 10 | 2 |
| Other | 85 | 335 | 49 | -38 | -34 | 607 | 2,147 | 310 |
| Lobster, Deep-water: | | | | | | | | |
| water | 142 | 2,953 | 428 | -31 | -32 | 308 | 6,562 | 952 |
| Other | 9 | 22 | 3 | -30 | -82 | 14 | 126 | 18 |
| Processed: | | | | | | | | |
| Salted | 33 | 65 | 9 | -26 | -11 | 122 | 242 | 35 |
| Smoked | 1 | 8 | 1 | -33 | -64 | 1 | 34 | 5 |
| Canned: | | | | | | | | |
| Breeding and herring | 401 | 2,182 | 316 | -72 | -60 | 1,559 | 6,249 | 906 |
| Shrimp | 130 | 1,228 | 178 | -19 | -4 | 209 | 1,717 | 249 |
| Mussels | 34 | 209 | 30 | +117 | +101 | 24 | 154 | 22 |
| Other | 31 | 154 | 23 | +25 | +24 | 31 | 152 | 22 |
| Semi-preserved: | | | | | | | | |
| Caviar | 12 | 137 | 20 | -7 | -3 | 16 | 179 | 26 |
| Other | 1 | 3 | 4/ | +20 | +65 | 1 | 3 | 4/ |
| Fish solubles | 300 | 254 | 37 | +200 | +218 | 100 | 80 | 12 |
| Total | 6,386 | 26,777 | 3,683 | -12 | -15 | 12,187 | 51,932 | 7,530 |

1/Record year for quantity and value.
2/Comparable exports in 1962 amounted to 220 pounds and \$160.
3/Comparable exports in 1962 amounted to 9,920 pounds and \$1,495.
4/Less than \$1,000.
Source: Preliminary data from Ministry of Fisheries.
Note: One Danish kroner equals US\$0.145.

Denmark (Contd.):

1963 dropped 12 percent in quantity and 15 percent in value from those in the same period of 1962. All of the major export items were down substantially except cod fillets (up 5 percent in quantity and 7 percent in value). Exports of pond trout were down 5 percent from those in 1962 and the value was 2 percent lower. Exports of flatfish fillets, canned mussels, and fish solubles were up substantially from the 9 months in 1962 but those are not among Denmark's major export products to the United States.

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Exports to EEC and EFTA Countries: The value of fishery products and byproducts exported to the European Common Market (EEC) and European Free Trade Association (EFTA) countries in the first 9 months of 1963 was higher than in 1962 (table). Denmark's ex-

| Danish Exports of Fishery Products and Byproducts, by Area and Country, January-September 1963 | | | |
|---|-------------------|--|-----|
| Areas | January-September | | |
| | 1963 Value | Percentage Change of Value from 1962 | |
| | Million Kroner | US\$ Million | % |
| European Common Market (EEC) | 178 | 25.8 | + 5 |
| European Free Trade Association (EFTA) | 168 | 24.4 | + 7 |
| East Bloc | 24 | 3.5 | + 4 |
| Other | 71 | 10.2 | +13 |
| Total | 441 | 63.9 | + 7 |
| <u>Major Importing Countries:</u> | | | |
| West Germany | 107 | 15.5 | + 2 |
| United Kingdom | 84 | 12.2 | + 3 |
| Sweden | 43 | 6.2 | +16 |
| Italy | 28 | 4.1 | - 3 |
| United States | 27 | 3.9 | -15 |

ports to West Germany, the United Kingdom, and Sweden ranked in that order on the basis of value; Italy ranked fourth, the United States dropped to fifth place. (Regional Fishery Attache for Europe, United States Embassy, Copenhagen, January 29, 1964.)

* * * * *

VESSEL STABILITY REGULATIONS AND RECOMMENDATIONS:

Danish craft over 20 gross tons have been operating under new regulations with regard to stability tests since October 1, 1963. The changes resulted from the loss of 3 steel cutters in February 1962 and additional vessel losses later that fall. The new regulations

excerpted from announcements dated November 15, 1952, and May 29, 1963, on regulations for ship construction and equipment, section 53, read as follows:

"(a) In the case of every ship of 20 tons gross tonnage or over, the keel of which being laid on the 1st of October 1963 or later, there shall be submitted at the earliest possible opportunity, provisional information and calculations regarding the elements of stability of the ship, for consideration by the Directorate. When the ship is completed, an inclining test shall be carried out under the supervision of the Ships Inspection Service and final calculation of the elements of stability of the ship shall be made and furnished to the Directorate.

"(b) The Directorate may further direct that every ship shall undergo an inclining test under the supervision of the Ships Inspection Service, and may require to be furnished with such information and calculations as are dealt with in paragraph a.

"(c) For the purpose of ensuring the stability of the ship under normal service conditions, the Directorate may make such requirements as may be deemed necessary from the examinations made.

"(d) After completion of the stability examination, the master of the ship shall be supplied with all such information concerning the elements of stability that is necessary for the safety of the ship in normal service in undamaged condition.

"(e) The Directorate may exempt individual ships or types of ships from complying with all or some of the provisions of paragraph a."

It is reported that the new regulations have required many Danish vessels to take on more ballast and carry a smaller catch. Investigations showed that comparable vessels in other countries, the Netherlands, for example, were carrying more ballast. In addition, the Dutch vessels carried iced fish with a specific gravity of 0.75 whereas the Danish vessels carried industrial fish with a specific gravity of 1.0.

Additional Recommendations: Fishermen also have been informed by the Directorate of the Danish Government Ships Inspection Service that a responsible skipper and his crew should follow certain obvious rules when their vessel goes to sea. These rules are:

Denmark (Contd.):

"1. All oil tanks should be full on departure from port. Oil should not be used from bottom tanks until this is necessary for the operation of the engines.

"2. Since the freeboard is a very important element in the safety of a loaded vessel, the catch taken on board should be such as to correspond to a suitable freeboard. As a general rule a freeboard of less than 10 centimeters (3.937 inches) cannot be considered adequate. For many vessels this will mean that industrial fish can only be carried in the aft hold.

"3. All fishing gear and other large weights should be stowed as low in the vessel as possible.

"4. On-deck stowage of fish boxes should be restricted. If carried on deck, they should be so stowed as to permit water entering the boxes to drain off readily. It should be remembered that boxes stowed on or over the deck will impair the stability of the vessel; in such cases additional ballast should be taken on board.

"5. The hold should be subdivided by permanent bulkheads and be provided with pillars with grooves for loose planking. Ice and catch should be secured against shifting by means of planking fixed in the grooves of pillars.

"6. Hatches and ice-covers should be properly secured when not in use during fishing.

"7. All doors in deck house and fore-castle should be kept closed and secured in adverse weather conditions. It is pointed out that water under certain conditions may accumulate in the fore-castle and therefore proper draining must be provided from this space. The hawsepipe must also be secured in an efficient manner.

"8. Air pipes leading to oil tanks should either be carried to a sufficient height or secured in such a way as to prevent water from penetrating into the oil tanks.

"9. Wheelhouse doors should as far as possible be constructed so as to open outwards only.

"10. Freeing ports should be sufficient in number. If provided with flaps these shall always be capable of functioning and must not be locked in bad weather.

"11. Automatic steering should never be used in bad weather, because such steering prevents the vessel from being handled with due regard to wind and weather conditions." (Regional Fisheries Attache for Europe, Copenhagen, February 5, 1964.)

Note: See Commercial Fisheries Review, January 1963 p. 87.

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DANISH FISHERMEN PROTEST CARELESS DISPOSAL OF SOVIET FISHING GEAR:

A sharp protest has been sent to the Soviet Ambassador in Copenhagen by a fishermen's association in Skagen, Denmark, accusing Russian trawlers of carelessly disposing of imperishable nets of nylon and perlon in Danish waters. The discarded nets drift widely and can damage Danish gear. In some cases, the discarded nets are reported to have become entangled in the propellers of Danish cutters, placing them in a dangerous situation when the weather is stormy. Danish fishermen have also reported damaged trawls as a result of discarded Soviet herring barrels which have been thrown overboard. The Danish fishermen in Skagen, one of Denmark's largest fishing ports, want the Russian trawlers to take home the condemned gear and barrels or sink them in deep water in accordance with existing agreements.

Similar complaints were made in the last half of 1962. The normal course is for such complaints to be made to the Danish Fisheries Ministry. If well documented, they are then forwarded through the Foreign Ministry. Skagen fishermen this time have taken a more direct approach to the Soviet Ambassador. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 19, 1964.)

* * * * *

COPENHAGEN FISHERIES TRADE FAIR TO BE HELD IN SEPTEMBER 1964:

Sponsored by the Danish fishing industry, the 5th International Fisheries Trade Fair will be held September 11-20, 1964, in the Exhibition Hall "Forum" of Copenhagen. About 85 percent of the available exhibition area has already been reserved. At the 4th

Denmark (Contd.):

International Fisheries Trade Fair in 1962, fisheries exhibits from 14 nations were presented. Those included vessel engines from 33 firms in 11 countries.

Further information about the Fair may be obtained from The International Fisheries Trade Fair, 17 Blagaardsgade, Copenhagen N, Denmark. Telephone Luna 2001. Telegrams UNIFESAS.



Honduras

FISHERIES INVESTMENT OPPORTUNITY:

Fishermen on the Island of Utila, Bay Islands, Honduras, wish to contact an investor willing to install an ice plant, freezing equipment, and necessary power plant on the island. The community would provide a site at no cost to the investor. A spokesman for the fishermen has stated that fishermen on the island, using their own vessels, can easily catch 5,000 pounds of fish per day. A plan is envisioned whereby fishermen on the Island of Utila would contract to sell their entire catch to an investor installing refrigeration equipment; the investor would take all profits from export sales; and the price of the fish caught by the islanders would be determined by contract negotiations with a fishermen's cooperative.

Although no detailed study has been made, it is estimated that an investment of at least \$75,000 would be required to install a modest ice plant, freezer, and power plant on the island. However, it would be desirable to first obtain a tax and customs duty concession from the Honduran Government before entering into an investment of this nature. Only in this manner could the necessary equipment be imported into the country without payment of

high duties. (A number of new industries have been able to obtain similar concessions from Honduras in the past.)

The investment opportunity should be carefully explored by any prospective investor before entering into negotiations. For additional details write to Frank Spencer Morgan, Utila, Islas de la Bahia, Honduras. (United States Consulate, San Pedro Sula, February 13, 1964.)



Iceland

FISHERMEN PROTEST EX-VESSEL GROUND FISH PRICES:

A five-member board of arbitration in Iceland has determined that there will be no increase in the ex-vessel prices of cod and haddock during the current winter season (January through May 1964). The decision of the arbitration board is binding under the fish-pricing procedures established by the Icelandic Parliament in late 1961. However, fishermen have strongly protested the ruling and have the support of the Social Democrats, the Reykjavik Seamen's Union, and the Icelandic Federation of Labor. The Icelandic Government has promised to look into the matter.

The fishermen's income is based on the value of the catch, of which they receive a share. Unlike most occupational groups, they did not benefit from the 15-percent general wage increases granted in December 1963. The prices paid for cod and haddock, and the fishermen's share of the catch, were not increased during 1963.

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GOVERNMENT PASSES BILL TO AID FISHING INDUSTRY:

The Icelandic Government's bill to aid the fishing industry was passed by the Althing (Parliament) on January 30, 1964. The new law increases the retail sales tax from 3 to 5½ percent, rather than 5 percent as originally proposed. The income from the additional one-half percent will enable the fish-freezing plants to pay more for cod and haddock. This, in turn, will benefit the fishing vessel owners and the fishermen. The law also authorizes the Government to postpone various projects for which provision had already been made in the 1964 budget. In addition, the Government

Iceland (Contd.):

indicated in the explanatory notes to the bill that anticipated reductions in certain subsidies would be postponed.

While not denying the need to help the fishing industry, the opposition party argued during the Althing debate on the bill that tax increases for that purpose were unnecessary. (United States Embassy, Reykjavik, February 4, 1964.)



Ireland

TROUT FARMING EXPANDED:

Kerry County, Ireland, has gained a new trout farm which should eventually have a capacity of 100,000 fish. Located in Dingle, the farm was operating 5 ponds containing about 2,000 fish in January 1964. By the end of the year it was expected to have over 50 ponds. A large cold-storage plant will also be built at the farm, which is operated by a firm based in Antwerp, Belgium. (The Fishing News, January 17, 1964.)

Note: See Commercial Fisheries Review, June 1962 p. 47.



Israel

FREEZER-TRAWLER OPERATIONS EXPANDED:

Israel's first freezer-trawler, the Azgad I, began operating in 1961 and made good catches from fishing grounds off Northwest Africa. The owners expanded offshore operations in 1963 when they acquired the Azgad II, formerly a factoryship which was converted to a freezer-trawler vessel by a shipyard in Oslo, Norway. The Azgad II has a freezing capacity of 16 to 20 metric tons of fish per day, and a storage capacity of 300 tons of frozen fish. It is manned by a crew of 35, and driven by a 1,200-horsepower engine at 12½ to 13½ knots.

The firm operating the two freezer-trawlers has received several proposals for joint ventures with fishing companies in Africa. The Israeli firm, which is planning further development, is said to be considering the proposals (Alieia, November 1963.)

Note: See Commercial Fisheries Review, April 1962 p. 51.



Japan

FROZEN YELLOWFIN TUNA EXPORT MARKET TRENDS:

Since December 1963 large quantities of Japanese frozen yellowfin tuna shipped to the United States from Japan proper have been rejected by United States canners due to "green meat" condition. Rejects of 20-40 per cent per shipment have not been uncommon, and in some cases as much as 60 to 70 per cent of shipments have been rejected. In an extreme case an entire shipment was said to have been rejected.

Reportedly, the high percentage of rejects is said to have depressed the Japanese frozen yellowfin export market. As of the end of January 1964, gilled-and-gutted frozen yellowfin shipped to the United States from Japan proper were quoted at about US\$335 a short ton f.o.b., but the market was described as slow. Yellowfin transshipped from the Atlantic Ocean were quoted at \$300-310 a short ton f.o.b. Las Palmas. (Suisan Tsushin, January 27, 1964.)

FROZEN TUNA EXPORTS TO EUROPE AND AFRICA:

April-December 1963: A total of 49,899 tons of frozen tuna was approved by Japan for export to Italy, Yugoslavia, Czechoslovakia, Canary Islands (Las Palmas), and other countries during the period April 1-December 31, 1963, according to data compiled by the Japan Frozen Foods Exporters Association.

| Japanese Frozen Tuna Exports to Europe and Africa April-December 1963 | | | | | | |
|--|-------------------------|-----------|----------|----------|---------|--------|
| Country | Species ^{1/} | | | | | Total |
| | Albacore | Yellowfin | Big-Eyed | Skipjack | Bluefin | |
| |(Metric Tons)..... | | | | | |
| Italy | 984 | 22,378 | 5,662 | 100 | 4,363 | 33,487 |
| Yugoslavia . . . | 1,025 | 4,504 | 1,482 | 347 | 1,434 | 8,792 |
| Czechoslovakia | - | 83 | 1,294 | 220 | 190 | 1,787 |
| Canary Islands (Las Palmas). | 299 | 461 | 297 | 174 | 253 | 1,484 |
| Other | 1,159 | 445 | 1,109 | 1,109 | 527 | 4,349 |
| Total | 3,467 | 27,871 | 9,844 | 1,950 | 6,767 | 49,899 |

^{1/}Not identified as to kind of product--round, gilled-and-gutted, fillet, etc.

Shipments of frozen tuna from Japan proper included in the total of 49,899 tons were: Italy, 3,193 tons yellowfin and 338 tons bluefin; Las Palmas, 10 tons big-eyed and 47 tons bluefin; to other countries, 200 tons yellowfin tuna. (Fisheries Attache, United States Embassy, Tokyo, February 10, 1964.)

Japan (Contd.):

April-October 1963: A total of 32,764 metric tons of frozen tuna were validated for export to Italy, Yugoslavia, Czechoslovakia, and Ghana during April-October 1963,

The competition between packers, large and small, is said to be getting greater, with the larger companies actively promoting their products through different communication media. For example, one firm planned to launch a large sales campaign beginning Feb-

Japanese Frozen Tuna Exports to Europe and Africa, April-October 1963

| Country | Species ^{1/} | | | | | Total | |
|--------------------------|-----------------------|---------------|--------------|--------------|--------------|---------------|---------------|
| | Albacore | Yellowfin | Big-Eyed | Skipjack | Bluefin | 1963 | 1962 |
| | (Metric Tons) | | | | | | |
| Italy | 709 | 16,428 | 3,033 | 5 | 2,706 | 22,881 | 21,225 |
| Yugoslavia | 830 | 3,781 | 1,083 | 347 | 1,052 | 7,093 | 4,610 |
| Czechoslovakia | - | 83 | 1,022 | 220 | 190 | 1,515 | 453 |
| Ghana | - | 97 | 338 | 786 | 54 | 1,275 | 420 |
| Total | 1,539 | 29,389 | 5,476 | 1,358 | 4,002 | 32,764 | 26,708 |

^{1/}Not identified as to kind of product, as round, gilled-and gutted, fillet, etc.

according to data compiled by the Japan Frozen Foods Exporters Association. (Suisan Tsushin, January 22, 1964.)

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CANNERS DEVELOPING DOMESTIC CANNED TUNA SALES:

The large Japanese fishing companies are reported to be aggressively pushing their packs and sales of canned tuna in Japan. This trend has become conspicuous since the latter half of 1963 and is attributed in part to the upswing in domestic consumer demand for highly flavored canned tuna products. However, the real beginning of this trend is said to lie in the emphasis placed several years ago by the major companies on developing and capturing the domestic canned tuna market. Since then, the companies have come out with different forms of flavored canned tuna products, of which one of the better known products is the "tender tuna" pack.

ruary 1, 1964. As an inducement to consumers, that firm is offering six sets of foreign stamps for every 2 or 3 of their canned tuna labels (number of labels depending on can size) turned in to the firm. (Minato Shimbun, January 26, 1964.)

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EXPORTS OF CANNED TUNA, JANUARY-OCTOBER 1963:

A total of 3,728,484 cases of canned tuna valued at US\$29 million was exported by Japan during January-October 1963, according to data compiled by the Japan Export Canned Tuna Packers Association.

The United States took 57.8 percent of Japan's canned tuna exports valued at \$17.3 million during the 10-month period, most of which was tuna in brine. West Germany ranked second as the largest importer of Japanese canned tuna with 536,209 cases valued at \$3.6 mil-

Table 1 - Japanese Canned Tuna Exports by Species and Country of Destination, January-October 1963

| Product | United States | | Canada | | West Germany | | Other Countries | | Total | |
|---|------------------|-------------------|----------------|------------------|----------------|------------------|-----------------|------------------|------------------|-------------------|
| | No. of Cases | Value US\$ | No. of Cases | Value US\$ | No. of Cases | Value US\$ | No. of Cases | Value US\$ | No. of Cases | Value US\$ |
| Albacore: | | | | | | | | | | |
| In oil | - | - | 146,826 | 1,342,775 | 2,166 | 17,777 | 135,132 | 1,217,247 | 284,124 | 2,577,799 |
| In brine | 1,147,729 | 11,687,495 | - | - | - | - | - | - | 1,147,729 | 11,687,495 |
| Yellowfin & Big-eyed: | | | | | | | | | | |
| In oil | - | - | 1,855 | 15,716 | 223,906 | 1,591,375 | 359,647 | 2,692,245 | 585,408 | 4,299,336 |
| In brine | 310,891 | 260,021 | - | - | - | - | - | - | 310,891 | 260,021 |
| Skipjack: | | | | | | | | | | |
| In oil | - | - | 20,806 | 163,661 | 88,470 | 599,547 | 255,363 | 1,939,938 | 364,639 | 2,703,146 |
| In brine | 694,966 | 5,280,436 | - | - | - | - | - | - | 694,966 | 5,280,436 |
| Yellowfin, Big-eyed, Skipjack (In tomato sauce and seasoned) | 4,614 | 37,758 | 10,297 | 92,544 | 221,667 | 1,407,400 | 104,149 | 694,930 | 340,727 | 2,232,632 |
| Total | 2,158,200 | 17,265,710 | 179,784 | 1,614,696 | 536,209 | 3,616,099 | 854,291 | 6,544,360 | 3,728,484 | 29,040,865 |

Note: Standard case equivalent to 48 7-oz. cans.

Japan (Contd.):

| Product | Cases <u>1/</u> | Value |
|---|------------------|-------------------|
| | No. | US\$ |
| Albacore: | | |
| In oil | 284,124 | 2,577,799 |
| In brine | 1,147,729 | 11,687,495 |
| Yellowfin & Big-eyed: | | |
| In oil | 585,408 | 4,299,336 |
| In brine | 310,891 | 260,021 |
| Skipjack: | | |
| In oil | 364,639 | 2,703,146 |
| In brine | 694,966 | 5,280,436 |
| Yellowfin, Big-eyed, Skipjack (In tomato sauce and seasoned) | 340,727 | 2,232,632 |
| Total | 3,728,484 | 29,040,865 |

1/Standard case equivalent to 48 7-oz. cans.

lion. The exports to West Germany were made up of 59 percent tuna in oil (mostly yellowfin, big-eyed, and skipjack) and the remainder was tuna in tomato sauce and seasoned. (Fisheries Attache, United States Embassy, Tokyo, February 10, 1964.)

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MORE TUNA VESSELS MOVE TO NEW CALEDONIA AREA OF SOUTH PACIFIC:

The fleet of Japanese tuna-fishing vessels operating off New Caledonia was scheduled to be increased from 31 to 40 in early January 1964 and may be increased to 64 in April 1964.

In late 1963, at least 2 or 3 Japanese tuna vessels were arriving each day at Noumea, New Caledonia, to deliver their catches to the Japanese refrigerated vessel Eiyo Maru. There have been reports that a second Japanese refrigerator vessel will be brought to New Caledonia because the Eiyo Maru is too small to handle the present fleet's catch. (Pacific Islands Monthly, January 1964.)

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TUNA TRANSSHIPMENT BASE IN COSTA RICA PLANNED:

An application for permission to establish a tuna transshipment base in Costa Rica was submitted by one of Japan's largest fishing companies for approval of the Japanese Frozen Tuna Producers Association. (Suisan Tsushin, January 16, 1964.)

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BOTTOMFISH VESSEL OPERATIONS FOR 1964 IN EASTERN BERING SEA APPROVED:

On January 13, 1964, the Japanese Central Fisheries Coordination Council approved the operation of 14 motherships and 228 catcher vessels for the eastern Bering Sea bottomfish fishery in 1964. This is a reduction from 1963 of 5 motherships and 24 catcher vessels. (Suisancho Nippo, January 16, 1964.)

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NEW SALMON FACTORYSHIP TO BE BUILT BY FISHING FIRM:

The construction of a 10,000-ton factoryship is to be started in September 1964 by a Japanese fishing firm as replacement for the 50-year old salmon mothership Kyoho Maru (7,158 gross tons). Completion date of the vessel is March 1965. The total construction cost is estimated at two billion yen (US\$5.6 million). (Suisancho Nippo, January 13, 1964.)

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FISHERY DEVELOPMENTS IN WEST AFRICA:

Following the imposition of 6 pence (7 U. S. cents) per pound duty on imports of fresh and frozen fishery products by the Ghanaian Government on October 21, 1963, Japanese fishing firms operating trawlers off the west coast of Africa began to intensify their search for other new markets and fishing bases in West Africa. One Japanese firm was recently reported to have established in Nigeria a joint company which is constructing a 1,000-ton capacity cold-storage plant. Another Japanese firm is now reported to have succeeded in arranging for the delivery of its trawl catches to a privately operated 800-ton capacity cold-storage plant in Nigeria. (Suisancho Nippo, January 25, 1964.)

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FISH MEAL IMPORTS FROM PERU APPROVED:

The importation by Japan of 20,000 metric tons of Peruvian fish meal in February 1964 at a c.i.f. price of US\$132-133 a metric ton was approved by the Japanese Livestock Bureau, Ministry of Agriculture and Forestry. Earlier in December 1963, the Bureau had approved the importation of a similar quantity of Peruvian fish meal. (Suisancho Nippo, January 16, 1964.)

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Japan (Contd.):

CONSOLIDATION OF WHALING OPERATIONS IN BRAZIL BEING STUDIED BY TWO JAPANESE FISHING FIRMS:

A study on the feasibility of consolidating their whaling operations in Brazil is being studied by two large Japanese fishing firms. One of those firms is a partner in a joint whaling company with a Brazilian firm, and operates the whale catcher vessels Tone Maru Nos. 8 and 11. The joint company's whale-processing plant is located at Cabo Frio in Brazil. The other Japanese fishing firm is a partner of a different Brazilian firm which is located at Recife, and operates the whale catcher vessel Daishin Maru. (Suisan Tsushin, February 18, 1964.)

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WHALING BASES IN SOUTH AMERICA TO BE SURVEYED BY WHALING FIRM:

Whaling bases in South America were to be surveyed by an official of one of Japan's whaling firms who was scheduled to leave for Ecuador on January 28. Reportedly, he was also to personally supervise the exploration of the waters off Ecuador to which the Japanese whaling firm is sending the whale catcher vessel Seki Maru No. 8. The Seki Maru was scheduled to arrive off Ecuador in late January. (Suisan Keizai Shimbun, January 24 and 26, 1964.)

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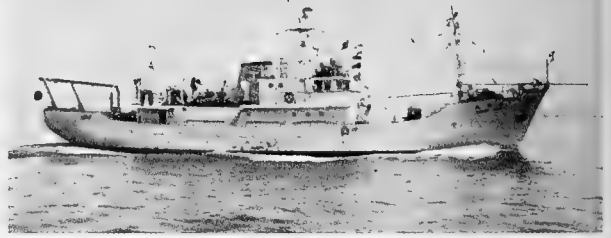
DECISION ON SALE OFFER OF NETHERLANDS WHALING FACTORYSHIP POSTPONED:

The Director of the Japanese Fisheries Agency met in January 1964 with officials of Japan's three large fishing companies engaged in whaling to discuss the offer made by the Netherlands Whaling Company to sell to Japan its whale factoryship Willem Barendsz (26,830 gross tons), including the factoryship's international whale catch quota of 6 percent. The companies are reported to have agreed to not act on the offer until after the 1964 meeting of the International Whaling Commission. (Minato Shimbun, January 28, 1964.)

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NEW OCEANOGRAPHIC VESSEL DELIVERED:

Japan's newest oceanographic vessel, the Tansei Maru, built for the Ocean Research In-



The Tansei Maru, newest oceanographic research vessel.

stitute, University of Tokyo, was delivered in July 1963. She was constructed expressly for oceanographic research from the keel up, and is equipped with precise deep-sea sounding instruments, a shallow-sounding sonar, a fish-shoal detector, and other measuring devices. The vessel will be used for basic oceanographic research including physics, geology, and biophysics. (National Oceanographic Data Center Newsletter, December 31, 1963.)

日本

Republic of Korea

ITALIAN-FRENCH CONTRACT TO BUILD FISHING VESSELS MODIFIED:

On January 21, 1963, an Italian-French consortium signed a contract with the Government of the Republic of Korea to supply Korea with 159 modern fishing vessels at a cost of about US\$58 million. The obligations under the contract were reduced by addenda signed December 11, 1963, and February 3, 1964, by representatives of the Italian and French groups and the Korea Marine Industry Development Corporation, assignee of the Government of Korea. The contract now calls for the delivery of only 91 vessels valued at about \$35.8 million, with the understanding that, if both sides agree, a contract for the balance may be negotiated not later than December 30, 1965.

Under the amended contract, the French group will build and deliver 10 side trawlers of 130 gross registered tons (g.r.t.), 61 tuna long-line vessels of 144 g.r.t., 2 stern trawlers of 220 g.r.t., 2 stern trawlers of 1,300 g.r.t., and 1 research and training vessel of 300 g.r.t. The delivery schedule calls for 51 of those vessels to be delivered in 1964 and 1965, and the remainder in 1966. The total price of the vessels (not including the engines which will be installed by the Italian group),

Republic of Korea (Contd.):

amounts to US\$18,679,678. A payment guarantee has been issued by the Bank of Korea. Payments equalling 10 percent of the total price will be made as a down payment by September 30, 1964.

Under the amended contract, the Italian group will deliver 15 vessels, as well as marine motors and equipment for the French vessels described above. The delivery schedule for the Italian vessels calls for 6 to be delivered in 1965 and the remainder in 1966. The total price of the Italian vessels and supplies amounts to \$17,152,970. A payment guarantee has been issued by the Bank of Korea. Payments equalling 10 percent of the total price will be made as a down payment by September 30, 1964. (United States Embassy, Seoul, February 14, 1964.)

Note: See *Commercial Fisheries Review*, Dec. 1963 p. 72, Oct. 1963 p. 60, Apr. 1963 p. 63, and Feb. 1963 p. 67.



Mexico

LARGE-SCALE EXPANSION OF FISHERIES INDUSTRIES PLANNED:

A broad program to provide the public with more fishery products to improve the protein content of the national diet has been launched by the Mexican Government. The program includes production of fishery products, processing and refrigeration, transportation, distribution, and public education. The campaign has been featured by the Mexican press and was to be followed by a large marine resources exhibition scheduled to open on February 14, 1964. Meanwhile, construction of fishery facilities is in progress and research on fishery resources has been augmented.

The program to develop Mexico's fisheries is the responsibility of the National Advisory Commission on Fisheries (Comision Nacional Consultiva de Pesca, known as CNCP) which was organized in 1962. The President of the Commission is General Abelardo L. Rodriguez, who was formerly President of the Mexican Republic and also a leading pioneer of the fishing industry. Other officers of the Commission include the Director General of Mexico's Fisheries Department through whose office the work of the Commission and the Fisheries Department is coordinated. Other members include Government and industry leaders.

Cooperating in the program with the Ministry of Industry and Commerce, of which CNCP and the Department of Fisheries are agencies, is the National Bank of Development for Cooperatives.

The principal points of the program as announced by the President of the Commission are:

1. Establishment of plants on both coasts for production of fish protein concentrate (fish flour) for human and animal consumption. Apparently some within CNCP feel that there is insufficient raw material to do this on a large scale but an effort is planned nevertheless.

2. Exploitation of the shark resources of the Tres Marias Islands in the Pacific. This point received much press notice

because of the proposal to provide the penal colony's inmates with a useful occupation.

3. Construction of industrial plants for better use of marine products. The one at Zihuatanejo, Guerrero, to develop the turtle industry, was scheduled for a February opening. Other plants are projected for the States of Colima, Veracruz, Tamaulipas, and Yucatan, and the territory of Baja California.

4. Construction of refrigeration plants for domestically marketed finfish.

5. Improving the distribution system for fish and shellfish, including a large modern distribution center in Mexico City.

6. Providing good quality fish in quantity and at reasonable prices to major population centers.

7. Training fishermen in the improvement and modernization of their activities, and perfecting the system and organization of cooperatives.

8. Creation of research centers to study the nutritive value of marine products. This work has commenced at the central laboratory.

9. Coastal patrol to "Protect coastal resources from North American fleets." According to *Tiempo*, the Fisheries Department's three new helicopters recently "surprised 70 Mexican boats in a closed fishing area."

10. An educational campaign among the people to extol the nutritional benefits of fish and to urge at least two seafood meals a week.

Also under way is a program to dredge sandbars at entrances to lagoons in Tamaulipas and Sinaloa, with the cooperation of the Ministry of Marine. The free passage of salt water is expected to prevent the death of large amounts of fish and shrimp.

Studies are continuing in an effort to rebuild the pearl fishery in La Paz, Baja California.

The opinion of interested observers is that three rather unrelated features of Mexico's national effort to increase domestic utilization of fishery resources are of great significance. These are all reported to be in advanced stages of development and are:

1. Centralization (in 1962) of the fisheries research work of the Department of Fisheries and CNCP in the Institute of Fisheries Biological Investigations. The Institute has pulled together several scattered activities, and high-level research is now centered in Mexico City, with work at the several coastal field stations under direct supervision of the Institute.

2. Construction of a "pilot" fishing port at Alvarado on the Gulf of Mexico, to supply fish for the Mexico City market. This 104 million peso (US\$8,320,000) port is being built by the National Bank of Development for Cooperatives with private Dutch capital and with technical assistance from the Food and Agriculture Organization of the United Nations (FAO). Land fill, docks, and buildings are on the way to completion and the first of several experimental fishing vessels has arrived from the Netherlands.

3. The First Salon of the Sea and Its Resources was an ambitious exhibit held in conjunction with the Seventh Home Fair which opened for 30 days commencing February 14 in Mexico City. CNCP and numerous cooperating agencies set up an exhibit of marine science and demonstration at that Fair which occupies 4,300 square yards. The objective was to bring home to the landlocked inhabitants of the capital city some idea of the importance of the ocean in fulfilling their nutritional needs.

The present campaign in Mexico for increasing domestic consumption of fishery products to improve the national diet has received considerable attention in the Mexico City press as it gains momentum. *Excelsior*, one of the leading daily newspapers, carried a front page headline story on

Mexico (Contd.):

January 2, 1964, outlining the program. On the following day, it devoted its lead editorial to support of the program. Other newspapers carried shorter articles. The news magazine *Tiempo* carried a four-column illustrated article in its business section on January 20, 1964.

Excelsior's editorial was reported to be like a call to arms, urging the people of Mexico to look to their 9,000 kilometers (5,600 miles) of richly endowed coastline, thus "changing the customs and habits of a nation looking mostly to the earth as a means of sustenance." Mexico is asked to emulate the maritime people of South America, Japan, and Norway in harvesting the sea. In a country that is increasing by a million persons a year the nutritive needs must be met by a combination of the resources of the land and the sea. With a wealth of seafood available, "there is no social, economic, or moral justification for people to subsist on beans and tortillas only," the editorial stated.

Several weeks before its opening date, the marine resources exhibition planned with the February 14 Seventh Home Fair was already receiving considerable attention in the local press.

It was reported that those responsible for the various parts of the program are well aware of the magnitude and complexity of the task facing them. Points of difficulty mentioned by responsible Mexican officials and industry leaders include the following:

1. The diet of the Mexican people in general is protein deficient, but the deficiency can be corrected by increased use of fishery products.
2. A built-in resistance to fish products exists and has existed since before the time of the Aztec Empire, largely as a matter of habit resulting from the general unavailability of fishery products at low prices in most parts of the country.
3. There is no general aversion to fishery products as evidenced by the heavy demand among people who can afford it and who live where it is available.
4. A publicity campaign can increase the use of fishery products. However, there is not much point in telling people about fish if it can't be supplied regularly and in quantity at low cost. A full-fledged educational program, if not backed up by production and distribution, would result in failure of the whole effort.
5. Conversely it would be equally futile to catch and distribute great quantities of fish if the people haven't been educated to eat it. For one thing, the market would be ruined by price cutting and any existing private sector of the industry would collapse.
6. Building fishing ports and experimental fishing vessels does not automatically guarantee that fish will be caught. Fleets of refrigerated trucks won't automatically transport fishery products. New cold-storage plants will not fill and empty by themselves. It will be necessary to build each type of facility at the same time and the people to operate them will have to be trained and given incentives to insure their successful operation.
7. The problems of transportation, distribution, and educational efforts will not be the same for the 5 million people concentrated in the capital city as they will be for the 30 million scattered all over the large country. Distributing fish evenly to those who need it most is believed to be a difficult matter.
8. The retail price of fishery products will have to be so low to reach those most in need that the profit factor to either the Government enterprise or the private sector will develop into a problem.
9. Coastal resources alone may prove inadequate. Mexican fishermen are by habit landbound and will have to make

use of the ocean resources that are the backbone of all great fishing nations.

10. The heavy dependence of the Mexican fishery on the export market for shrimp must be replaced by a broader base of exploitation of other resources. The problem of the "one-crop" economy is well known to those planning the program. Broadening the base, however, should not in any way jeopardize the important money crop of shrimp.

Some opinions were that overemphasis of any one phase of the program could result in adverse effects. Those who are responsible for the program are working on the problem of balancing all of its aspects--catching, processing, transportation, cold storage, distribution, marketing and consumer education, not to mention resource and nutrition research. How well the complex problems are solved will determine the success of the whole program. (Fishery Attache, United States Embassy, Mexico, February 4, 1964.)

* * * * *

FIRST OF FIVE MULTIPLE-USE FISHING VESSELS RECEIVED FROM NETHERLANDS:

The first of five multiple-use fishing vessels has been received by the Mexican Government for use at the pilot fishing port at Alvarado, Veracruz, Mexico.



Fig. 1 - Mexican multiple-use fishing vessel built in Netherlands.

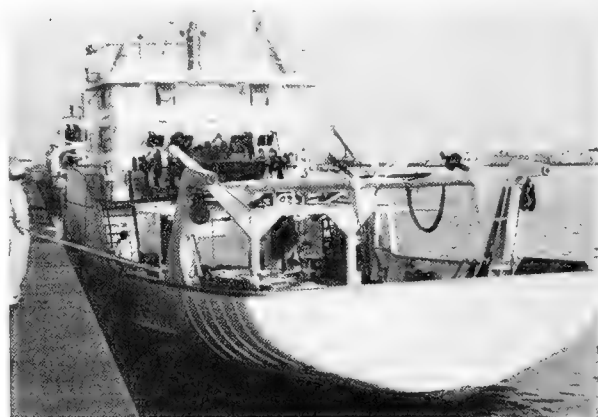


Fig. 2 - Stern view of Mexican multiple-use fishing vessel.

Mexico (Contd.):

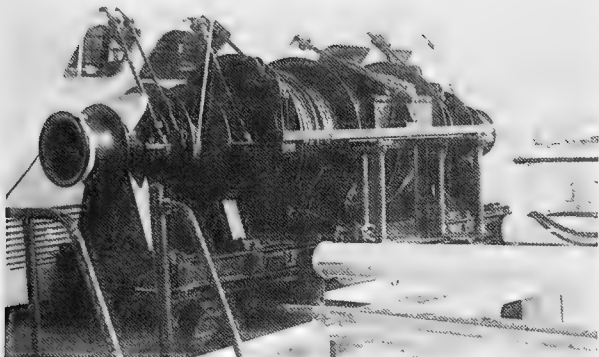


Fig. 3 - Winch stations located on bridge of multiple-use fishing vessel.

The vessels are being built in the Netherlands and are intended for use in instructing fishermen of the Alvarado region. They can be used for shrimp fishing as well as purse seining and beam trawling. They are powered by twin Diesels of 245 hp. each, driving a single shaft. Refrigerated holds have a capacity of 100 metric tons at a temperature of 1° C. (33.8° F.). The winch stations are operated from the bridge and are powered by takeoffs from the main engines. Electronic equipment aboard the vessels includes a fishfinder in addition to the depth indicator, automatic pilot, and radio. (United States Consulate, Veracruz, January 29, 1964.)



Morocco

NEW TUNA CANNERY BEING BUILT IN TANGIER:

A new tuna cannery is being built at Tangier, Morocco, by the Societe Generale de Pecheries et Conserves au Maroc. Hopes are that it will be completed in time for the 1964 Moroccan tuna fishing season which begins in April and ends in July. The major stockholders consist of four persons who are officials of the cannery, the Banque Union Parisienne and the Societe Generale itself.

The new cannery covers an area of 5,144 square yards. In addition there is a boiler shed covering 119 square yards. The plant is expected to have a capacity of 60 metric tons (66 short tons) of canned tuna a day. Plant equipment consists of ten 1,760-pound capacity containers in which the fish is boiled, an automatic continuous oiling machine 15 yards long for putting hot olive oil in the cans, and 3 vacuum cookers each with a 106-cubic-foot capacity. The equipment is all Moroccan built. In addition there are 2 American-type band saws to cut the fish, 2 Spanish and 2 French can sealers, and 1 Spanish can washer and oil recoverer. The Societe is considering purchasing a machine to pack the fish in the cans. For the time being, the cans will be packed by 150 to 200 women.

The cannery will use Moroccan-caught bluefin (red) tuna (*Thunnus thynnus*), "melva" or frigate mackerel (*Auxis*

thezard), and "sarda" or little tuna (*Euthynnus alletteratus*). The fish will be packed in cans of 2.8 ounces, 8.8 ounces, 1-lb. 2 ounces, 2 lbs. 3 ounces, and 5 lbs. 7 ounces for the local market and in 5.5 and 11 pound cans for the export market. The cans will contain meat from the belly, side, and back either mixed or separately.

No foreign-caught raw tuna will be used unless the Societe can obtain permission to import frozen Japanese and United States-caught bluefin tuna. The company would like to import such frozen tuna in order to keep the plant running during the entire year because the firm's catch itself will not be sufficient for that purpose. The matter is being negotiated by the company and the customs authorities. The problem appears to be that the local customs authorities want to assess a duty on the gross weight of the fish rather than on the weight to be exported alone. Even though the fish will be imported in bond, since it will not remain in Morocco, this issue is important because it determines the size of the bond assessed and the amount of its refund.

The Societe plans to sell its tuna both on the local market and abroad. Its largest foreign markets are Italy and Switzerland. Furthermore, it hopes to keep its position in the Algerian and Tunisian markets depending upon political conditions.

If the company is able to import Japanese and United States-caught tuna, it will try to enter the United States market as well as to improve its position in Europe. (United States Consulate, Tangier, February 1, 1964.)

* * * * *

CANNED SARDINE MARKET TRENDS AND EXPORTS, 1963:

The total 1963 Moroccan canned sardine pack at the end of December was reported as 1,660,000 cases, or 36.2 percent below the 1962 pack of 2,600,000 cases. Stocks on hand at the beginning of the 1963/64 season were 482,000 cases which brings supplies available for the year to 2,142,000 cases. This is about 300,000 cases below the sales program goal of 2,450,000 cases.

The Moroccan canned sardine industry has no specific plans for closing this nominal gap of about 300,000 cases. Sardine fishing has recently been resumed at Agadir in good offshore weather, but the catch has not been of commercial quality or quantity. The canneries at Safi are closed for seasonal repairs and are not expected to resume operations until mid-April when catches are anticipated to be limited since the preseason runs of sardines are generally not abundant.

Exports of canned sardines through December 1963 totaled 1,170,000 cases. Sales of canned sardines through October 1963 amounted to about one million cases. Movements significantly different from the pattern of sales indicated include large deliveries to Czechoslovakia in December and a stronger demand from West Germany. Both the Union Commerciale de l'Industrie de la Conserve (UCIC), the trade association which predominantly controls exports of sardines to the European and United States markets, and individual canners state their intentions of meeting orders as they come until supplies run out, although preference will naturally go to established customers. UCIC has recently experienced a rather unexpected success in the German market with a pack of sardines put up to American specifications, but not taken by the buyer for whom they were packed. Since the local industry is, in general terms, less than optimistic about its long-term chances for markedly expanding the demand for sardines in the European market, it is likely that orders from Germany will receive some priority.

Observers point out that the potential shortage of supply in the period between early April and late June does not seem to cause much concern to the Moroccan industry. In fact, this shortage is seen as contributing to an unaccustomed firmness in demand as well as price on the world market which is affected also by a subnormal year for the Portuguese canned sardine industry. There is confidence

Morocco (Contd.):

| Moroccan Canned Sardine Exports by Country of Destination June 1-October 31, 1963 | |
|--|-----------------|
| Area and Country | Number of Cases |
| Franc Zone: | |
| France | 278, 840 |
| Madagascar | 23, 805 |
| Ivory Coast | 21, 297 |
| Dahomey | 10, 235 |
| Others | 19, 363 |
| Total | 353, 540 |
| Dollar Zone: | |
| Costa Rica | 5, 225 |
| Peru | 4, 770 |
| United States | 2, 815 |
| Others | 6, 634 |
| Total | 19, 444 |
| Sterling Zone: | |
| Ghana | 117, 768 |
| Nigeria | 36, 759 |
| Tanganyika | 10, 825 |
| Others | 9, 996 |
| Total | 175, 348 |
| Others Areas: | |
| West Germany | 99, 743 |
| Czechoslovakia | 97, 628 |
| Cuba | 75, 625 |
| Italy | 57, 931 |
| Benelux Countries | 27, 860 |
| Austria | 16, 600 |
| Poland | 16, 000 |
| Finland | 9, 293 |
| Others | 30, 869 |
| Total | 431, 549 |
| Grand Total | 979, 881 |
| Source of data: Office Cherifien de Controle et d'Exportation. | |

that the high-quality Moroccan product may win some new customers for the future, and that it will not lose permanently any traditional market because of a temporary lack of supply. (United States Consulate, Casablanca, February 1, 1964.)



Netherlands

FISHERIES TRENDS, 1963:

Fishery landings in the Netherlands in 1963 amounted to 289,000 metric tons valued at Fl.141.5 million (US\$39.1 million), according to the Netherlands Commodity Board for Fish and Fish Products. This is an increase of 13.8 percent in quantity from the 1962 landings but the value was down 12 percent.

Fishery products exports by the Netherlands during the year totaled 174,200 tons valued at Fl.183 million (\$50.5 million), a drop of 1.4 percent in quantity and 4.1 percent in value as compared with the 1962 exports. It was the first time since World War II that the value of that country's fishery products exports dropped. (United States Embassy, The Hague, February 1, 1964.)

* * * * *

WHALING FACTORYSHIP
OFFERED FOR SALE TO JAPAN:

The president of the Netherlands Whaling Company (Amsterdam), on his visit to Japan in January 1964, announced that his firm would like to sell to Japan the factoryship Willem Barendsz (26,830 gross tons) including the factoryship's international whale catch quota of 6 percent. Officials of the three major Japanese whaling companies were scheduled to meet in late January with Japan's Fisheries Agency Director and the Agency's Production Chief to study the Netherlands Whaling Company's offer. (Suisan Keizai Shimbun, January 26, 1964.)



New Zealand

EXPLORATORY FISHING AND
MARINE RESEARCH:

In late 1963, the New Zealand Minister of Marine reviewed the investigations of his department designed to aid the fishing industry. The Minister said that during the past three years much had been achieved. Work included systematic trawling surveys during all seasons in the Bay of Plenty and in the Auckland-North Cape area to obtain knowledge of fish growth and movements.

An officer to work on tuna problems in New Zealand and in Australia had been appointed.

There had been biological studies of fish in Cook Strait. In another study, extensive marking of flatfish in South Island waters had shown that they moved in a southerly direction. Studies of the movements and growth of the commercially important elephantfish had also been made. A biologist had also been appointed to begin a study of whitebait.

A study of the Lake Ellesmere yellow-eyed mullet to provide a basis for netting regulations was completed.

Other studies showed that seals near the New Zealand coasts did not eat commercial species of fish to any extent.

The Minister recalled that a whale biologist and a technician had been appointed to study the distribution, movements, and numbers of whales, in cooperation with other New Zealand agencies.

Much, however, remained to be done, he said. He called for more exploratory fishing, particularly for tuna, and said there must be deep-water trawl surveys to find new grounds for fishermen. (Commercial Fishing, a New Zealand fishery periodical, January 1964.)



Norway

EXPORTS OF CANNED FISHERY PRODUCTS,
JANUARY-OCTOBER 1963:

Smoked small sild sardines in oil was Norway's most important canned fish export in January-October 1963, accounting for 40.7 percent of the quantity and 34.3 percent of the

Norway (Contd.):

value of total exports of canned fishery products. Combined exports of smoked small sild sardines in oil, smoked brisling in oil, and kippered herring accounted for 70.1 percent of the quantity and 68.5 percent of the value of Norway's exports of canned fishery products in January-October 1963.

NORWEGIAN FIRM TO ESTABLISH FISH STICK PLANT IN NEW BEDFORD, MASS.:

Norsk Frossenfisk A/L, a joint sales organization of 110 Norwegian fish-freezing plants, has decided to build a new fish stick plant in New Bedford, Mass. It will be operated by its United States subsidiary. Production is expected to start next fall.

Table 1 - Norwegian Exports of Canned Fishery Products by Type, January-October 1963

| Product | October 1963 | | | January-October 1963 | | |
|-------------------------------|--------------|-----------------|------------|----------------------|-----------------|------------|
| | Quantity | Value | | Quantity | Value | |
| | Metric Tons | N. Kroner 1,000 | US\$ 1,000 | Metric Tons | N. Kroner 1,000 | US\$ 1,000 |
| Smoked brisling in oil | 518 | 3,508 | 490 | 4,063 | 27,930 | 3,906 |
| Smoked brisling in tomato | 93 | 506 | 71 | 417 | 2,320 | 324 |
| Smoked small sild in oil | 1,149 | 4,927 | 689 | 9,220 | 38,976 | 5,451 |
| Smoked small sild in tomato | 175 | 627 | 88 | 1,208 | 4,366 | 611 |
| Unsmoked small sild in oil | 249 | 793 | 111 | 753 | 2,437 | 341 |
| Unsmoked small sild in tomato | 8 | 31 | 4 | 46 | 172 | 24 |
| Kippered herring (Kippers) | 261 | 1,143 | 160 | 2,599 | 11,010 | 1,540 |
| Mackerel | 52 | 216 | 30 | 548 | 2,582 | 361 |
| Roe unclassified | 79 | 272 | 38 | 1,238 | 4,440 | 621 |
| Soft herring roe | 50 | 263 | 37 | 672 | 3,306 | 462 |
| Fish balls | 54 | 143 | 20 | 473 | 1,229 | 172 |
| Other canned fish | 22 | 157 | 22 | 138 | 1,035 | 145 |
| Shellfish | 145 | 1,483 | 207 | 1,290 | 13,879 | 1,941 |
| Total | 2,855 | 14,069 | 1,967 | 22,665 | 113,682 | 15,899 |

Table 2 - Norwegian Exports of Canned Fishery Products^{1/} by Country of Destination, January-October 1963

| Country of Destination | October 1963 | | | January-October 1963 | | |
|------------------------|--------------|-----------------|------------|----------------------|-----------------|------------|
| | Quantity | Value | | Quantity | Value | |
| | Metric Tons | N. Kroner 1,000 | US\$ 1,000 | Metric Tons | N. Kroner 1,000 | US\$ 1,000 |
| Finland | 25 | 143 | 20 | 127 | 806 | 112 |
| Sweden | 29 | 139 | 19 | 313 | 1,608 | 225 |
| Belgium-Luxembourg | 46 | 233 | 32 | 540 | 2,580 | 361 |
| Ireland | 12 | 49 | 7 | 206 | 726 | 101 |
| France | 29 | 110 | 15 | 236 | 954 | 133 |
| Netherlands | 27 | 126 | 18 | 169 | 619 | 87 |
| United Kingdom | 344 | 1,745 | 244 | 4,226 | 18,370 | 2,569 |
| West Germany | 70 | 282 | 39 | 618 | 2,323 | 325 |
| East Germany | - | - | - | 982 | 3,532 | 494 |
| Japan | 1 | 8 | 1 | 211 | 976 | 137 |
| South Africa Republic | 109 | 474 | 66 | 1,103 | 4,604 | 644 |
| Iraq | 8 | 32 | 4 | 40 | 153 | 21 |
| Canada | 247 | 1,472 | 206 | 851 | 5,129 | 717 |
| United States | 1,191 | 6,009 | 840 | 9,668 | 50,403 | 7,049 |
| Australia | 346 | 1,126 | 157 | 1,427 | 5,451 | 762 |
| New Zealand | 22 | 87 | 12 | 440 | 1,882 | 263 |
| Other countries | 552 | 1,924 | 269 | 1,776 | 6,281 | 878 |
| Total ^{2/} | 3,058 | 13,959 | 1,950 | 22,933 | 106,397 | 14,879 |

^{1/}Does not include exports of canned shellfish.

^{2/}Totals are slightly larger than the combined exports of canned fish (excluding shellfish) shown in table 1.

Notes: (1)Norwegian kroner 7.15 equal US\$1.

(2)See Commercial Fisheries Review, May 1963 p. 79.

The United States was the leading buyer of Norwegian canned fish during January-October 1963, taking 42.2 percent of total exports (excluding shellfish), or 9,668 metric tons valued at N. kroner 50.4 million (US\$7.0 million) as compared with 11,186 metric tons valued at N. kroner 58.0 million (\$8.1 million) in the same period of 1962. (Norwegian Canners Export Journal, January 1964.)

The fish stick plant which the United States subsidiary has been operating at Mobile, Ala., since 1955, will be moved to New Bedford. Norwegian Frozen Fish, Inc., which handles sales in the United States, will also move its office to the New England port. Frozen fish blocks, the raw material for fish sticks, will be shipped from Norway directly to New Bedford.

Norway (Contd.):

In 1963 Norsk Frossenfisk, which sells to 30 countries, distributed 44,500 metric tons of frozen fish products with a gross sales value of some Kr.190 million (US\$26.5 million), as against Kr. 179 million (\$25.0 million) in 1962. The Norwegian firm's biggest market is the United States which bought 12,000 tons of products in 1963. (News of Norway, February 6, 1964.)

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ANTARCTIC WHALE OIL PRODUCTION, FEBRUARY 8, 1964:

Norway's 4 Antarctic whaling expeditions had processed 108,145 barrels of whale oil and 35,205 barrels of sperm oil, or a total of 143,350 barrels, as of February 8, 1964. This was an increase of 10,543 barrels of whale oil and 1,080 barrels of sperm oil over that processed in the same period of the 1962/63 Antarctic season. (News of Norway, February 27, 1964.)



Panama

FISHERIES TRENDS, 1963:

Panama's commercial fishery products in 1963 were valued at nearly US\$9 million (since the bulk is exported, the value represents the f.o.b. export value). Less than 10 percent of that value was from sales of some 4 million pounds of fresh fish for domestic consumption.



Fig. 1 - Small fish meal plant on Taboga Island. Capacity is 12 tons per hour.

The products packed for export were about 13 million pounds of frozen headless shrimp (value f.o.b. was US\$8.0 million), 100,000 pounds frozen spiny lobster tails (f.o.b. value \$50,000), and 100,000 pounds of scallop meats (f.o.b. value \$45,000). Most of those products were exported to the United States.

The year's landings of inedible fish species (thread herring and anchoveta) yielded 1,754 short tons (f.o.b. value \$210,480) of fish meal and 44,000 pounds (f.o.b. value \$3,080) of fish oil.



Fig. 2 - Panamanian sardine fish meal ready for export.

Panama's fishery landings for the most part are frozen for export, but some fish are marketed fresh mostly in Panama City and in the Canal Zone. Most of Panama's shrimp production (white, pink, titi, and tiger species) is absorbed by the export market, and in 1963 about 10 million pounds of frozen shrimp was exported to the United States. The 1963 shrimp

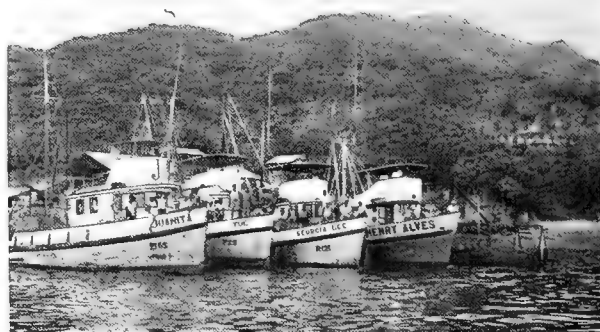


Fig. 3 - Part of the purse-seining fleet at anchor, Taboga Island.

Panama (Contd.):

production was a record one. Practically all of the fish meal produced is sold to other Central American countries and to Germany. Premium prices were reported paid by Germany for fish meal produced in Panama.



Fig. 4 - Sardine fishing off Punta Chame. Average set yields 30 short tons of fish.



Fig. 5 - Herring fishing in the Gulf of Panama.

A two-year exploratory program for spiny lobster (*Panulirus gracilis*), sponsored by the U. S. Agency for International Development (AID) Mission to Panama as an Alliance for Progress program, showed that Panama has the potential of producing 2 million pounds of

spiny lobsters a year. The AID program in collaboration with the Cooperative for American Relief Everywhere (CARE) has helped establish two fishery cooperatives within the past two years. Assistance given by those agencies included fishing dories, a cold-storage and freezer plant, and refrigerated delivery trucks. The program was designed to assist the local provincial fishing industry and to supplement the protein-deficient diet of inhabitants in Panama's interior provinces.



Fig. 6 - Fish-meal plant in Puerto Caimito, with a capacity of 10 tons per hour.

During spiny lobster explorations (conducted by the U. S. Bureau of Commercial Fisheries chartered vessel *Pelican*) in the fall of 1963, scallop beds were discovered in the Gulf of Panama. Two of Panama's larger fishing firms became active in scallop fishing and in three days fishing produced as much as 30,000 pounds of scallops in the shell. Opinions in Panama were that a new fishery could be developed with a potential of possibly 10 million pounds of scallop meats a year. As many as 15 vessels were working the newly discovered scallop grounds by the end of 1963. Catch rates of scallops per vessel were high



Fig. 7 - A new 58-foot purse-seiner made in Panama.

Panama (Contd.):

and full vessel loads were taken in 2 or 3 days of fishing, working only during daylight hours. The principal market for the scallop meats is the United States. As of early 1964 fishing for scallops had stopped because the selling price was not considered profitable.



Fig. 8 - Two new 60-foot steel shrimp trawlers built in Panama.



Fig. 9 - Tuna transferring operation off Taboga Island.



Fig. 10 - A new 32-foot steel lobster boat off Panama City.

The Asociacion Nacional de la Industria Pesquera was organized in 1963 for the mutual benefit of Panama's fishing industry. Because commercial fishermen have concentrated on the more profitable shrimp fish-

ery, the newly-formed Asociacion has made efforts to develop a more diversified Panamanian commercial fishery in order to relieve the strain on the shrimp fishery and prevent overfishing of Panama's shrimp grounds.

A recommendation made by the Asociacion to the Government of Panama during the year was that a marine terminal be established inside the Panama Canal Zone under the Panamanian Government's jurisdiction so that fishing vessels may enter or leave at any time without restriction. A law was reported being prepared by the Panamanian Government which would permit the free entry of foreign sardine purse seiners into Panama's territorial waters so that their catches could be sold locally thereby increasing Panama's fish meal and oil production. Due to lack of credit and financing, Panama's fish-meal industry has not been able to move ahead to the same extent as the shrimp industry.

--Carlos A. Arosemena Lacayo, President,
Asociacion Nacional de la Industria
Pesquera Panamena,
Panama, R. de Panama

Note: See Commercial Fisheries Review, February 1964 p. 78; December 1963 p. 76; July 1963 p. 90.



Peru

RECORD ANCHOVETA CATCH FORECAST IN 1964:

Anchoveta fishing was good in Peru in 1963 and should be even better in 1964. The Director of the Institute of Marine Resources in Peru said that production in 1963 is expected to be about 5 percent above the 1962 level. The key criteria that Institute technicians use for projecting the anchoveta catch and estimating the current state of the fish supply are: (1) size of fish caught--a trend towards smaller fish is unfavorable; (2) catch per vessel trip; and (3) deaths among the birds that feed on the anchoveta. All three factors are considered favorable this year.

It was noted that anchoveta were harder to find during 1963, but the Director of the Institute said this was due largely to oceanographic reasons, and not to any significant decline in numbers.

In projecting a good year in 1964, scientists cautioned that longer run forecasts were impossible to make. The anchoveta attain maturity in about two years and, consequently, there is not a "pipeline" of fish which can be counted on for harvest in coming years. Thus, sharp losses of adult fish in one year as a result of unfavorable oceanographic conditions could spell difficulty in the following year. The great danger to the continued availability of the anchoveta supply is that a sharp decline in the fish population as the result of a "nino" (warm water moving into the normally cold currents in which the fish thrive) compounded by intensive fishing could so damage the breeding stock that production would be held down for a number of years. Barring such a combination of circumstances, fishery experts see no immediate threat to the industry stemming from short supplies.

Peru (Contd.):

Still unexplained is the decline in the yield of anchoveta body oil reported recently by a large Peruvian exporter. The firm stated that the anchoveta oil yield in early 1964 was running about 1 percent by weight of fish processed, whereas in the past yields have reached 7 percent by weight.

A financial readjustment in the Peruvian fish meal industry is taking place, according to an economist with the Institute of Marine Resources. He said that the large, well-financed, efficient producers would undoubtedly survive any transitory difficulties. On the other hand, the marginal producers face serious problems because they are poorly financed and lack efficient equipment. They may lose half of their catch during processing, whereas the major producers with modern, capital-intensive techniques are able to get a much higher yield.

The Institute of Marine Resources is sponsored by the Food and Agriculture Organization (FAO) of the United Nations. The anchoveta industry has been the Institute's primary concern; however this role is changing. FAO technicians in Peru are satisfied that the anchoveta industry is through the most critical stages of its growth. The major producers now have resources and ability to develop their own production, processing, and distribution methods. As a result, the FAO focus is shifting. First, on the technical side, the Institute plans to experiment with new fishing techniques. The group is also considering the problems of improved production, distribution, and increasing fish consumption in Peru, particularly in the Sierra region where protein foods are in short supply. (United States Embassy, Lima, January 9, 1964.)

* * * * *

FISHERIES CATCH OFF IN 1963:

The Peruvian fisheries catch during 1963 totaled 6.6 million metric tons, up slightly from the 6.5 million tons caught during 1962, according to the Sociedad Nacional de Pesca. The leveling off of fish production in 1963 coupled with the tightening of credit in the fish-meal industry have slowed activity in Peruvian shipyards. Of the 30 shipbuilding firms in the Callao area, some 70 percent are said to be idle.

The size of anchoveta caught out of the port of Chimbote has been declining recently. The Institute of Marine Resources in Peru is considering the possibility that this may be an indication of overfishing. Accordingly, if the trend at Chimbote continues and is substantiated by reports from other ports, it may be an indication that the anchoveta catch cannot be sustained much above present levels. (United States Embassy, Lima, February 13, 1964.)

* * * * *

PERUVIAN FACILITIES OF UNITED STATES FISHERY FIRM TO BE EXTENDED:

A United States firm is expected to invest about US\$3 million to expand its fish meal and canned fish facilities in Peru, according to

an announcement on January 17, 1964, of the Peruvian Minister of Finance and Commerce. The Peruvian Government has approved the new investment of the United States company which is becoming a leading firm in Peru's fishing industry. (United States Embassy, Lima, January 29, 1964.)



Poland

FISHING BASE REPORTED PLANNED IN CANARY ISLANDS:

A base for Polish fishing vessels operating off the West African coast was to be opened in February 1964 at Las Palmas in the Canary Islands, according to an article in the Polish periodical Kurier Szczeciński of December 18, 1963. No details were given on the base except that initially it will contain cold-storage facilities for 400 metric tons of fish, with an expanded capacity to 1,500 tons by July 1964.

Observations drawn from this article are that the opening of this base will permit a considerable expansion of Poland's mid-Atlantic fishing operations. The Polish press has been advocating the promotion of a larger and more competitive Polish fishing fleet. It has stressed that if Poland's fishery production goals are to be met, new fishing grounds will have to be fished and a modern fleet built to operate in long distance waters. (United States Consulate, Poznan, January 13, 1964.) Note: See Commercial Fisheries Review, May 1963 p. 83.



Portugal

FISHERIES TRENDS, JANUARY 1964:

The Portuguese Government ban on trawling for shellfish has been lifted in most areas, although the prohibition still applies inside a six-mile coastal zone. In addition to opening new fields to fishermen, this might lower Portuguese shellfish prices which have been higher than those in either Spain or France. (United States Embassy, Lisbon, February 1, 1964.)

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NEW FREEZER-TRAWLERS PLANNED:

The construction of five stern trawlers equipped for freezing fish at sea is planned

Portugal (Contd.):

by Portuguese shipbuilding firms. The vessels of German design will have a length of 53 meters (174 feet) between perpendiculars. Three of the new trawlers will be built at Viana do Castelo and the other two at Mondego. State financial assistance and credit facilities have been extended for the construction of the vessels which may work in African waters off Angola.

Other vessel construction includes that of the Fisheries Society of Aveiro which is constructing two large trawlers, 80 meters (262 feet) in length, for the cod fishery in the Northwest Atlantic. (Puntal-Revista Maritima y Pesquera, October 1963.)

**Rumania****ANOTHER STERN TRAWLER ORDERED FROM JAPAN:**

The construction of a 3,500-ton stern trawler ordered by Rumania is expected to be completed shortly. The trawler is being built at a shipyard in Osaka, Japan. According to an earlier press report, Rumania placed orders for two similar stern trawlers with Japan, one of which was to be delivered in December 1963 and the other some time during 1964. (Minato Shimbun, January 26, 1964, and other sources.)

**St. Pierre****HARBOR AND PROCESSING FACILITIES IMPROVED:**

A modernization program is being conducted at the harbor of St. Pierre, a French possession located in the Northwest Atlantic south of Newfoundland. A dike will be built to protect the harbor, and a new pier will be constructed which will provide 86,000 square feet of working space. A new freezing plant, and a new fish-meal plant will be erected on the pier.

The new pier will allow the docking of vessels which have a draft of 18 feet. Traffic in the harbor declined from 1,116 vessels (488,015 gross tonnage) in 1961 to 847 vessels (346,868 gross tonnage) in 1963. Vessels

stopping at the harbor are mainly fishing vessels. Many Spanish vessels call at St. Pierre.

At present, one local fishery firm (partly owned by the Government) is active at St. Pierre. It owns a small fishing fleet which is locally outfitted. The concern operates (1) a freezing plant which is able to process whole fish or fish fillets, (2) a fish meal unit for processing fish scrap, (3) a fleet of five trawlers which catch bottomfish, and (4) an ice-making plant. The firm's output in recent years has been broken down as follows:

| Year | Frozen Products | Fish Meal |
|-----------------|------------------------------|-----------|
| | (Million Pounds) | |
| 1963 (9 months) | 3.8 | - |
| 1962 | 4.4 | 1.3 |
| 1961 | 6.0 | 1.9 |
| 1960 | 4.5 | 1.6 |

Those products are sold partly to France and partly to the United States.

**Sudan****SOVIET FISHERY TECHNICIANS COMPLETE SURVEY OF RED SEA WATERS:**

Some 27 Soviet fishery technicians who had been surveying commercial fisheries prospects in the Sudan's Red Sea territorial waters since June 1963, completed their assignment by January 1964 when they were scheduled to return to the Soviet Union. Their report was to be submitted to the Sudanese in April 1964.

A second group of 13 Soviet fisheries specialists which arrived in Sudan in August 1963, for a survey on White Nile fisheries prospects was reported to still be in that country at the beginning of this year. (United States Embassy, Khartoum, January 19, 1964.)

Note: See Commercial Fisheries Review, September 1963 p. 98.

**Sweden****WITHDRAWAL FROM INTERNATIONAL WHALING CONVENTION:**

On December 18, 1963, Sweden gave notice that effective June 30, 1964, it would withdraw from the International Whaling Convention. Established in 1948, the Convention was designed to preserve the dwindling whale stocks

Sweden (Contd.):

through scientific study and regulation of catches. (The U. S. Department of State Bulletin, January 27, 1964.)



Tanganyika

**FISHERY RESOURCES
SURVEYED BY JAPANESE:**

The marine fisheries of Tanganyika are very primitive, with fishing restricted mainly to canoe-type operations, according to a Japanese survey of the fisheries of that country. The Japan Overseas Fisheries Association (government-sponsored organization) met on January 21 at Tokyo to report on the findings of the survey group the Association sent to Tanganyika in October 1963. Thus, the burden of developing a joint fishery enterprise, as well as marketing outlets, in that country will fall almost wholly on Japan, and will require large capitalization and close guidance. In establishing a fisheries enterprise in that country, adequate assurances of protection from the governments of Japan and Tanganyika should first be obtained, according to the Association.

As for marine fishery resources off Tanganyika, the nearby waters appear to abound in such species as sea bream, barracuda, Spanish mackerel, mullet, and lobster, while the offshore waters abound in spearfish, yellowfin tuna, and albacore tuna. Also, Tanganyika has a number of good ports, which include Dar es Salaam. (Suisan Keizai Shim-bun, January 22, 1964.)



U. S. S. R.

FISHERY PLANS FOR 1964:

According to an announcement in a Soviet periodical dated December 31, 1963, the Soviet Union in 1964 plans to: (1) send several motherships accompanied by 50 fishing vessels to the tuna and mackerel fishing grounds in the Arabian Sea area; (2) fish on a commercial scale for mackerel in the East China Sea by using fishing vessels equipped with large purse seines; (3) operate in the Bering Sea four large refrigerated trawlers, which will fish at depths of about 328-383 fathoms (those

trawlers were reported to have left for the fishing grounds in December 1963); (4) fish with purse seines for herring in the waters off Iceland; and (5) cooperate with the fishing fleets of Poland and the German Democratic Republic (East Germany) in developing the deep-sea fishing grounds in the Northwest Atlantic Ocean. (Suisancho Nippo, January 17, 1964.)

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**CONSTRUCTION STARTED
OF NINTH FACTORYSHIP:**

The Soviet Union is reported to have started the construction of a very large factoryship at the Leningrad Admiralty Shipyard. That vessel will be the ninth factoryship, and the largest of its kind, to be built at that shipyard. The eighth factoryship being built at the Leningrad Shipyard is scheduled to be completed and placed in operation some time in 1964. Some



Russian king crab factoryship Andrei Zakharov.

of the other Soviet factoryships built at the Leningrad Shipyard are the Andrei Zakharov, Evengnii Nikishin, and the Aleksander Obukhov in the 15,000-ton range. (Suisancho Nippo, January 18, 1964.)

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SOVIET VESSELS BEING BUILT IN JAPAN:

The construction of 20 fishing vessels by Japan for the Soviet Union was referred to in the Japan-U.S.S.R. Trade and Payments Agreement for 1963-1965 signed February 5, 1963, in Tokyo. By February 1964, contracts for the construction of 13 of the vessels had been reported as follows:

Five tuna vessels for the Soviet Union will be built in a shipyard at Mukaishima under a May 1963 contract. Specifications call for

U. S. S. R. (Contd.):

each vessel to have a deadweight tonnage of 2,850 tons and a price of US\$3.5 million.

Eight fish factoryships for the Soviet Union will be built in a shipyard at Yokohama under a June 1963 contract. Specifications call for each vessel to have a deadweight tonnage of 10,000 tons and a price of \$7.55 million.

Payment terms for the vessels were reported to be 30 percent down, with the balance payable in semiannual installments over 5½ years commencing on delivery with an annual interest rate of 4 percent.

According to the Japan-U. S. S. R. 1964 trade Protocol which was signed February 10, 1964, in Tokyo, and which revises the 1964 trade targets originally set in the basic Trade and Payments Agreement, 3 tuna motherhips will be delivered to the Soviets in 1964, to be followed by 2 tuna motherships and 3 other vessels for the Soviet fishing fleet in 1965, and 5 vessels in 1966. (United States Embassy, Tokyo, February 14, 1964.)

Note: See Commercial Fisheries Review, August 1963 p. 112.

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SOVIET INTERFERENCE WITH DANISH FISHING OPERATIONS CLAIMED:

Damage to Danish salmon fishing gear by Russian vessels has been claimed by the Director of a Copenhagen export firm which has 35 salmon cutters fishing in the Eastern Baltic Sea, according to newspaper reports. Two Russian vessels were said to have cut light buoys from Danish gear on January 30, 1964. A Danish cutter reported the registration numbers of the vessels said to be involved. A protest will be filed with the Danish Fisheries Ministry. An earlier protest by fishermen and request for diplomatic action could not be handled by the Ministry because of insufficient evidence.

The Soviet authorities are reported to require, among other things, the exact time of the alleged action, positive identification of the vessel, and its exact position. Since the Danish cutters fish as much as 25-30 kilometers (15.5-18.6 miles) of long-line gear, such evidence often is difficult to obtain.

In the past, there have been cases of compensation for gear damage by the Soviet Union, but conclusive evidence was required. In

most cases submitted to the Danish Fisheries Ministry, the Danish cutters have been unable to provide such evidence. There also is a possibility that, in some instances, the Danish cutters have been close to the Soviet fishery limits. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 5, 1964.)

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SALMON FARMING IN LATVIA:

Success in rearing salmon in man-made pools and reservoirs is claimed by fishery scientists at the Tome fish-breeding plant in Latvia. They point out that an appropriate inexpensive fish feed would be needed to expand the salmon-rearing project to a commercial scale. A fish food that is close to natural feeds in chemical composition has been developed by the Baltic Fish-Breeding Research Institute in Riga. The Latvian scientists say that artificial feeding sharply reduces the time young salmon must spend in inland waters. Under natural conditions, the fry hatched in Baltic streams require 2 years to grow big enough to leave the rivers for the sea, but artificial feeding is said to reduce this period to 10 months.

Latvia plans to expand their fish-farming program by building another breeding plant on the River Salats, which empties into the Bay of Riga. (The Fishing News, January 17, 1964.)

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SIBERIAN FRESH-WATER FISHERIES:

There is some concern among the Soviet Union's Siberian fishermen that the proposed construction of the Angara-Yenisei hydroelectric power project in Central Siberia may adversely affect fish populations in the Yenisei River which has been an abundant source for whitefish, sturgeon, and other species. To this, the Assistant Director of the Siberian Branch of the Federal Scientific Research Institute for Fisheries said the hydroelectric power project could only improve that fishery without any detriment to the resource.

Construction of the hydroelectric power plant will result in large reservoirs which will serve as fish farms. One of the reservoirs that will be formed will be about 240 miles long and cover an area of more than 500,000 acres with an average depth of 40 feet and a maximum of 115 feet. Reservoirs that

U. S. S. R. (Contd.):

will be created after construction of the dam will be favorable for fish as there will be plenty of oxygen and food. It is believed that the loss of some of the Yenisei River fish, because of their migration to tributaries, would be compensated by populating the reservoirs with other fresh-water fish including species similar to those now indigenous to the Yenisei. The "newcomers" to the reservoirs, it is anticipated, will account for 53 percent of the annual catch from the reservoirs, or about 1,800 metric tons.

To conserve the fish resource in the Yenisei until the reservoirs are filled in, it is proposed to prohibit fishing of the valuable food species for three years. The ban will cover sturgeon, graylings, and other species considered of higher value, as well as pike which are taken by seine nets.

Several species which spawn in the autumn may be unable to propagate because of decreased water levels caused by constant needs of the hydroelectric plant and decreased water supply during winter months. Those species will be cultivated on a fish farm, which will be built near the city of Abakan in the upper reaches of the Yenisei. The fish farm will raise about 160 million fry annually. Similar measures will be taken, depending on local conditions, in other reservoirs formed by the Angara-Yenisei hydroelectric power project. Those projects are expected to bring about a much greater fish production in the Yenisei and Angara by 1980. (Trade News, November-December 1963.)



United Kingdom

FISHERY LOANS
INTEREST RATES REVISED:

The British White Fish Authority announced that, as a result of changes in the rates of interest charged to them, their own rates on advances made from December 7, 1963, for fishing vessels of not more than 140 feet, and new engines, nets, and gear would be as follows: on loans for not more than five years, $5\frac{1}{8}$ percent (increase $\frac{1}{8}$ percent); on loans for more than 5 years but not more than 10 years, $5\frac{1}{4}$ percent (increase $\frac{1}{8}$ percent); on loans for more than 10 years but not more than 15 years, $5\frac{3}{4}$ percent (in-

crease $\frac{1}{8}$ percent); and on loans for more than 15 years but not more than 20 years, 6 percent (increase $\frac{1}{8}$ percent). (Fish Trades Gazette, December 21, 1963.)

Note: See Commercial Fisheries Review, March 1964 p. 72.

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BRITISH INTRODUCE NEW RESERVE
AUCTION FIRST SALES PRICES
FOR FISH LANDINGS:

A new schedule of reserve auction prices for first sales of fresh fish landed by British trawlers in England and Wales was introduced by the British Trawlers Federation (BTF) for the year starting February 3, 1964. Although the reserve prices of various individual species have been adjusted, this is the first general revision since 1957. Reserve prices of certain species have remained unchanged since 1950.

The BTF pointed out that despite heavy increases in costs during the past seven years and the growing scarcity of fish, increases have been limited over-all to less than one-half pence (0.58 U.S. cent) a pound. The Federation said that reserve prices remain well below average costs of production and are in existence so as to limit those fluctuations in first sales prices which benefit neither the producer nor the consumer. The Federation felt that actual average prices paid are generally well above their respective reserve prices and it is unlikely that dockside prices will rise as a result of this revision by as much as one-half pence a pound, and that there is no reason for the consumer to expect any significant increase in prices at the retail level.

For the principal species such as cod and haddock, the year is divided, as in 1963, into three periods with a reserve price applied to each. But the summer period for 1964, when reserve prices are at their lowest, has been extended to the end of August. The autumn and winter period, when reserve prices are at their seasonal highest, has been shortened correspondingly. Further, the reserve prices of cod and haddock are unchanged during this period because, as occurred in 1963, small cod has its own reserve price which is well below the price of other cod. The favorable treatment accorded small cod is designed to eliminate temporary gluts and provide stocks of frozen fish in midwinter when landings are usually light.

It was explained that many of the other revisions were made because reserve prices were out of line with market conditions. An example cited was the price increase for Dover sole to 1 shilling 6-pence a pound (about 21 U.S. cents). In 1962 that species' average price was 3 shillings (42 U.S. cents), but the new reserve price is only about one-half as much. Trawler owners were of the opinion that some increase in the price of Dover sole was necessary considering the very low level to which first sales prices dropped in the first four months of 1963. They pointed out, however, that prices at retail had not dropped during that period. At that time, unusually good weather increased landings by 155 percent but only 36 percent more money was received for the fish. To prevent uneconomic fluctuations of that type, reserve prices of other principal species have been brought up to date.

In announcing the increase in reserve prices, the Federation's president said that it was very difficult to wholly offset the effects of rising costs, lower landings, and a system of fish marketing which permits a degree of price fluctuation that is detrimental to the fish producers and is, at best, of no benefit to consumers. It was pointed out that evidence of the plight of the British trawling industry is the fact that arrears on repayments of loans from the White Fish Authority now amount to £1.3 million (US\$3.6 million). He added that "In the circumstances, therefore, the in-

United Kingdom (Contd.):

creases in reserve prices are modest. It cannot be pretended that they alone will put the industry right, but they should bring about a more realistic structure of fish prices and also bring these into a better relationship with costs..." (Fishing News, January 10, 1964.)

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NEW FREEZER-TRAWLER LAUNCHED:

The Ross Valiant, a new stern trawler designed to freeze fish at sea, was launched at Selby, England, on January 30, 1964. The vessel, which is scheduled for completion in July 1964, is the first of two similar freezer-trawlers ordered by a large British fishing company. The Ross Valiant will be able to store 400 tons of frozen fish at -20° F. Before being placed in cold storage, fish will be gutted, washed, and then frozen (as whole fish) in 100-pound blocks. (A special thawing unit for the fish blocks was recently installed by the owner of the Ross Valiant at a filleting plant onshore.) The Ross Valiant carries 10 plate freezers with a combined daily freezing capacity of 35 tons.



Launching of the new freezer-trawler Ross Valiant at Selby, England.

The dimensions of the vessel are: length over-all 226'6", length between perpendiculars 190'0"; moulded breadth 36'6"; moulded depth at main deck 17'0"; depth at upper deck 24'6".

The vessel is driven by a Diesel-electric power system. Diesel power is provided by three 8-cylinder pressure-charged and inter-cooled engines. Each engine develops 1,135 b.hp., at 1,000 r.p.m. and drives a 445 kw., d.c. generator; 200 kw. (250 kVA) alternators are flexibly coupled in tandem to each generator. Intercoupled on the constant current loop system, the three generators provide power for two 825-b.hp. propulsion motors which, running at 1,000 r.p.m., provide a propeller shaft speed of 175 r.p.m. (maximum) through a reduction gearbox.

The vessel is equipped with an electric trawl winch, having two main drums, each with a capacity of 1,500 fathoms of 3 $\frac{1}{8}$ " circ. warp, and two warping drums, each with a capacity of 150 fathoms of 2 $\frac{7}{8}$ " circ. warp. Power is provided by a winch motor developing 300 b.hp. at 650 r.p.m.

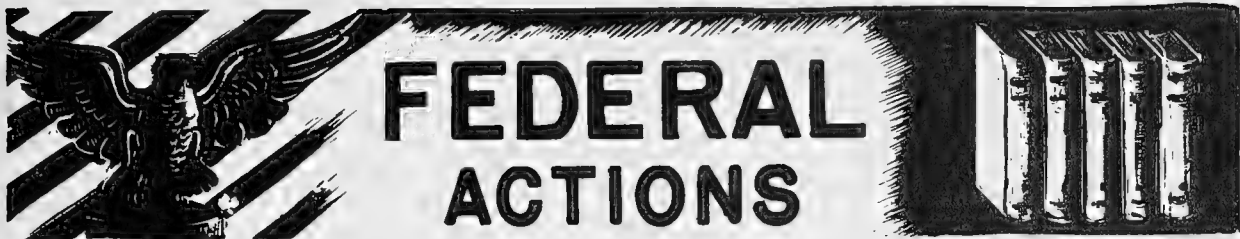
The owner of the Ross Valiant is one of Britain's largest integrated fishing companies. The Ross Valiant was the 39th trawler launched at Selby for the company since 1955 and the 6th distant-water vessel within the last 2 $\frac{1}{2}$ years.

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**BRITISH FREEZING EQUIPMENT
ORDERED FOR KOREAN
FISH-FACTORYSHIP:**

A British firm in early 1964 was scheduled to supply 28 vertical-plate freezers for a fish-factoryship (7,000 deadweight tons) under construction in Holland for Korean interests. The order will provide the vessel with a freezing capacity of 100 tons of whole-fish blocks every 24 hours. (Press release, Ross group, Grimsby, January 24, 1964.)





Department of Commerce

BUREAU OF THE CENSUS

ECONOMIC CENSUS OF COMMERCIAL FISHING INDUSTRY PLANNED:

A census covering the economic status of the commercial fishing industry in 1963 is planned by the Bureau of the Census of the U. S. Department of Commerce. Collection plans and questionnaires are being developed in close cooperation with the Bureau of Commercial Fisheries of the U. S. Department of the Interior.

A census of commercial fisheries was last conducted by the U. S. Bureau of the Census in 1908. Since that time, commercial fishery statistics have been compiled mainly by the Fish and Wildlife Service of the Department of the Interior and its predecessor, the Bureau of Fisheries of the Department of Commerce. Annual statistical digests are published by the Fish and Wildlife Service.

Tentative plans for the 1963 economic census include the collection of data on number and location of commercial fishing establishments, number of employees by months, annual payroll, receipts for landed catch, other business receipts, and number of boats and vessels by size. Mailing lists will be assembled with the cooperation of the Social Security Administration and the Internal Revenue Service.

The mail canvass, which will cover establishments with one or more employees, will be supplemented by a 50-percent sample of income tax returns for commercial fishermen with no employees. The "no employee" group is believed to account for a substantial portion of the annual value of fishery products.

The basic reporting unit in an economic census is the establishment as defined in the 1957 Standard Industrial Classification Manual of the Bureau of the Census. The mobility of commercial fishing operations suggests that problems may be encountered in defin-

ing establishments, particularly for multiple-operation companies. It is anticipated that a discussion of such problems with representative companies, as well as a protest of the data items, will be among the necessary steps preliminary to the actual canvass. (Statistical Reporter, Bureau of the Budget, February 1964.)



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

AMENDMENT REQUESTED IN STANDARD OF IDENTITY FOR CANNED TUNA:

Notice was given in the Federal Register, February 6, 1964, that a petition has been filed with the U. S. Food and Drug Administration proposing that the standard of identity for canned tuna (21 CFR 37.1) be amended to list sodium acid pyrophosphate in a quantity not to exceed 0.15-gram per ounce net weight of the canned tuna as an optional ingredient for inhibiting the development of struvite crystals in the food. The petition proposes that the paragraph of the standard in which optional ingredients are designated for label declaration be amended to provide that when sodium acid pyrophosphate is added the label shall bear the statement "pyrophosphate added" or "with added pyrophosphate."

All interested persons were invited to submit their views in writing regarding the proposal by March 7, 1964.

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PUBLIC HEARING ON STANDARDS OF IDENTITY FOR FROZEN RAW BREADED SHRIMP:

As previously announced, a public hearing on proposed standards for "frozen raw breaded shrimp" and "frozen raw lightly breaded shrimp" was held by the U. S. Food and Drug

Administration. The hearing began on February 17, 1964, in Washington, D. C.

Persons having expert knowledge of what consumers may expect in commercial breaded shrimp products were urged to participate.

Note: See Commercial Fisheries Review, February 1964 p. 88.



Interstate Commerce Commission

CHARGE FOR LESS-THAN-CARLOAD SHIPMENTS APPROVED:

The U. S. Interstate Commerce Commission voted not to suspend or investigate the railway express tariffs providing for an additional charge of 25 cents per shipment on all less-than-carload shipments of one or more packages. The increase became effective January 27, 1964. (National Fisheries Institute Flashes, February 7, 1964.)



Small Business Administration

ASSISTANCE FOR ECONOMIC INJURY SUFFERED BY GREAT LAKES FISHERY FIRMS:

Notice (Declaration No. 1) was published in the Federal Register (page 2713), February 26, 1964, that the U. S. Small Business Administration will receive applications for disaster assistance from small business concerns which have suffered substantial economic injury as a result of the drastic reduction in consumption of smoked fishery products from the Great Lakes area.

Financial assistance, if found to be necessary or appropriate, will be extended to small business concerns determined by the Small Business Administration to have suffered substantial economic injury. No applications under this Declaration shall be accepted subsequent to August 31, 1964.

The notice as it appeared in the Federal Register follows:

SMALL BUSINESS ADMINISTRATION

(Declaration No. 1)

SMOKED FISH FROM GREAT LAKES AREA

Diseased Products Disaster

Whereas, many small business firms are engaged in catching, processing and selling fish from the Great Lakes area; and

Whereas, the Food and Drug Administration on October 25, 1963, issued a statement warning the public of botulism in smoked fish from the Great Lakes area; and this warning was followed by a drastic reduction in consumption resulting in substantial economic injury to the Great Lakes fishing industry and to processors, distributors and retailers of smoked fish from the Great Lakes area; and

Whereas, the cause of the botulism was not known;

Now, therefore, as Administrator of the Small Business Administration, I hereby declare that the foregoing circumstances constitute a disaster within the meaning of section 7(b)(4) (Pub. Law 88-264) of the Small Business Act, as amended. Applications for disaster assistance will be received from small business concerns which have suffered substantial economic injury as a result thereof. Financial assistance, if found to be necessary or appropriate, will be extended to small business concerns determined by Small Business Administration to have suffered substantial economic injury as a result of this disaster. No applications under this Declaration shall be accepted subsequent to August 31, 1964.

EUGENE P. FOLEY,
Administrator.

FEBRUARY 6, 1964.



Department of the Treasury

BUREAU OF CUSTOMS

GROUND FISH FILLET IMPORT TARIFF-RATE QUOTA FOR 1964:

The reduced-tariff-rate import quota on fresh and frozen groundfish (cod, haddock, hake, pollock, cusk, and ocean perch) fillets and steaks for calendar year 1964 is 24,861,670 pounds. The Bureau of Customs announced in the February 6, 1964, Federal Register. Divided into quarterly quotas this means that 6,215,418 pounds of groundfish fillets and steaks during each quarter of 1964 may be imported at the 1-7/8 cents-per-pound rate of duty and any imports over the quarterly quota will be dutiable at the rate of 2-1/2 cents a pound.

The reduced-rate import quota for 1964 is 0.3 percent less than the 1963 quota of 24,874,871 pounds. From 1951 to 1960 the quantity of fresh and frozen groundfish fillets permitted to enter the United States at the reduced rate of duty of 1-7/8 cents a pound had increased 24.7 percent, but in 1961 the trend was reversed significantly for the first time because in 1960 frozen fish fillet blocks with bits and pieces were no longer dutiable under the Tariff category of "frozen groundfish fillets." A further decline took place in 1963 and in 1964 the quota is only slightly lower than the previous year.

Average aggregate apparent annual consumption in the United States of fresh and frozen groundfish fillets and steaks (including the fillet blocks and slabs used in the man-

| Reduced-Tariff-Rate Import Quota for Fresh and Frozen Groundfish Fillets, 1954-1964 | |
|---|------------|
| Year | Quota |
| | 1,000 Lbs. |
| 1964 | 24,862 |
| 1963 | 24,875 |
| 1962 | 28,571 |
| 1961 | 32,601 |
| 1960 | 36,533 |
| 1959 | 36,920 |
| 1958 | 35,892 |
| 1957 | 37,376 |
| 1956 | 35,197 |
| 1955 | 35,433 |
| 1954 | 33,950 |

ufacture of fish sticks, but excluding fish blocks since September 15, 1959, and blocks of fish bits) for the three years (1961-63) preceding 1964 was 165,744,467 pounds, calculated in accordance with headnote 1, Part 3A, Schedule 1, under item 110.50, of the Tariff Schedules of the United States. This was far below the consumption of 217,337,633 pounds in 1958-60 and 243,554,480 pounds for 1957-59.

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IMPORTS OF "HERRING SALAD" DUTIABLE AT 20 PERCENT AD VALOREM:

"Herring salad"--a product consisting of pickled herring, mayonnaise, pickles, carrots, onions, celery, and peas--has been classified by the U. S. Bureau of Customs under the provision for "Edible preparations, not specially provided for. . . : Other (duti-able at 20 percent ad valorem), item 182.91, Tariff Schedules of the United States. The decision was contained in a Bureau of Customs letter dated December 26, 1963. (Treasury Decisions, vol. 99, no. 3, January 16, 1964.)

Eighty-Eighth Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



COMMERCIAL FISHERIES FUND: On March 3-4, 1964, the Subcommittee on Fisheries and Wildlife of the House Committee on Merchant Marine and Fisher-

ies held a hearing on S. 627, and related bills, to promote State commercial fisheries research and development projects. Testimony was received from Senator Hart; Congressman Rivers of Alaska; Congressman St. Onge; Congressman Bennett; the Director of the Bureau of Commercial Fisheries; and public witnesses. The statement presented to the Subcommittee on H. R. 7710 (identical to S. 627) by Congressman St. Onge was inserted by him in the Congressional Record (Appendix pages A1112-1113), Mar. 4, 1964. The statement by Congressman Bennett describing the Great Lakes fisheries and their need for assistance was inserted by him in the Congressional Record (Appendix pages A1139-1140), March 5, 1964.

On March 16, 1964, the House received a memorial of the Legislature of the State of Alaska, memorializing the President and the Congress of the United States to take favorable action on S. 627.

CONSERVATION OF MARINE FISHERIES RESOURCES: The House Committee on Merchant Marine and Fisheries held hearings on February 20, 25, and 26, 1964, on S. 1988, and related bills, to prohibit fishing in the territorial waters of the United States and in certain other areas by persons other than nationals or inhabitants of the United States. Testimony was received from Congressman Rivers of Alaska; the Special Assistant for Fisheries and Wildlife of the Department of State; the Director of the Bureau of Commercial Fisheries; the Commandant of the Coast Guard; and public witnesses.

Also introduced in the House were H. R. 10028 (Wilson) on Feb. 19, 1964 and H. R. 10040 (Hagen) on Feb. 20, 1964; both similar to S. 1988; referred to the Committee on Merchant Marine and Fisheries. A statement by Congressman Wilson discussing the need for such legislation appeared in the Feb. 19, 1964, Congressional Record (page 3053).

Senator Gruening inserted in the Feb. 25, 1964, Congressional Record (pages 3340-3342), a statement by Senator Bartlett before the House Committee on Merchant Marine and Fisheries on Feb. 19, 1964, concerning the need for S. 1988. In the statement, Senator Bartlett also supported the establishment of a 12-mile fisheries limit.

The Senate Committee on Commerce met in executive session on March 3, 1964, to discuss certain problems relating to the Continental Shelf and territorial sea with officials of the Department of State, the Coast Guard, and the Bureau of Commercial Fisheries, Department of the Interior.

FISHERMEN'S FINANCIAL AID FOR ECONOMIC DISLOCATION: H. R. 10087 (Cederberg) introduced in House Feb. 25, 1964, to authorize the Secretary of the Interior to make payments to reestablish the purchasing power of American fishermen suffering temporary economic dislocation; referred to the Committee on Merchant Marine and Fisheries.

FISHERY CONSERVATION IN ALASKA: On March 12, 1964, Senator Gruening inserted in the Congressional Record (pages 4873-4874), a resolution of the Alaska State Legislature, relating to the fishery conservation and propagation contributions of the U. S. Army in Alaska.

FOOD-FOR-PEACE, AND FISH: On February 27, 1964, the Subcommittee on Foreign Agricultural Opera-

tions of the House Committee on Agriculture held a hearing on the implementation of the amendment made to the Mutual Security Act (P. L. 88-205) which makes fish eligible for export under P. L. 480 (83d Cong.) Testimony was received from Congressmen Tupper and McIntire; and public witnesses.

IMPORT COMMODITY LABELING: On March 4, 1964, during Senate consideration of H. R. 6196, a bill to encourage increased cotton consumption, maintain income of cotton producers, and provide research programs to lower production costs, Senator Miller submitted an amendment (No. 463) to the bill and stated, "this amendment is designed to require the labeling of imported meat, poultry, and fish, or any products therefrom, so that the purchaser, whether the wholesaler or the consumer, will know that such items have been imported into the United States or have not been produced in the United States." (Congressional Record, page 4217, Mar. 4, 1964.) On March 6, 1964, by a vote of 34 yeas to 55 nays, the Senate rejected Senator Miller's Amendment (as modified by acceptance of Senator Magnuson's Amendment thereto to include imported lumber).

INDIAN FISHING RIGHTS: On March 3, 1964, Congressman Westland addressed the House on the subject of Indian fishing rights in Washington State (Congressional Record, page 4078).

INTERIOR APPROPRIATIONS FY 1965: Department of the Interior and Related Agencies Appropriations for 1965 (Hearings before a Subcommittee of the Committee on Appropriations, House of Representatives, 88th Congress, 2nd Session), 1744 pp., printed. Contains hearings held on Department of the Interior programs and budget estimates for fiscal year 1965.

On March 13, 1964, the House Committee on Appropriations met in executive session and ordered reported favorably to the House without amendment H. R. 10433, a bill making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1965, and for other purposes. Included are funds for the Fish and Wildlife Service, its two bureaus--Commercial Fisheries and Sport Fisheries and Wildlife--and the Office of the Commissioner.

H. Rept. 1237, Department of the Interior and Related Agencies Appropriation Bill, 1965 (March 13, 1964, report from the Committee on Appropriations, House of Representatives, 88th Congress, 2nd Session, to accompany H. R. 10433), 45 pp., printed. The Committee recommended \$73,021,600 for the Fish and Wildlife Service for FY 1965, compared with budget estimates for FY 1965 of \$74,524,000 and 1964 appropriations of \$71,564,300. The Bureau of Commercial Fisheries portion for FY 1965 is \$23,587,900 (against 1965 budget estimates of \$26,495,000 and 1964 appropriations of \$23,985,900); the Bureau of Sport Fisheries and Wildlife portion for FY 1965 is \$49,008,700 (against 1965 budget estimates of \$47,636,000 and 1964 appropriations of \$47,192,400); and the amount for the Office of the Commissioner in FY 1965 is \$425,000 (against 1965 budget estimates of \$393,000 and 1964 appropriations of \$386,000).

The House by a voice vote on March 17, 1964, passed H. R. 10433.

On Feb. 27, 1964, the Senate Committee on Appropriations continued hearings on fiscal 1965 budget estimates for the Department of the Interior, and related agencies, receiving testimony from the Commissioner of the

Fish and Wildlife Service, the Director of the Bureau of Commercial Fisheries, and the Director of the Bureau of Sport Fisheries and Wildlife.

OCEANOGRAPHIC RESEARCH VESSEL INSPECTION: S. 2552 (Magnuson) introduced in Senate Feb. 26, 1964, to exempt oceanographic research vessels from the application of certain vessel inspection laws, and for other purposes; referred to the Committee on Commerce. Introducing the bill, Senator Magnuson spoke from the floor of the Senate (Congressional Record, page 3589, Feb. 26, 1964) stating that the bill had been prepared after consultation with the Coast Guard, and after extensive discussions with members of the Research Vessel Operators Council, representing oceanographic institutions operating oceangoing vessels. Excerpts from a statement prepared by the Council in justification of the proposed legislation were quoted by Senator Magnuson, in part, as follows: ". . . At the present time research vessels, other than those operated as public vessels, are inspected and certificated by the Coast Guard under regulations established for merchant cargo and passenger vessels. . . . The fact that research vessels are considered within the scope of merchant vessels results in a situation which is complicated and confusing. . . . The mission of a research vessel is neither military nor commercial, but it is a special service which requires separate rules and regulations if the vessel is to be the effective instrument demanded by the substantial national investment in the marine sciences." Senator Magnuson emphasized that the bill was not intended to alter safety regulations.

H. R. 10441 (Keith) introduced in House March 16, 1964, similar to S. 2552; referred to the Committee on Merchant Marine and Fisheries.

OCEANOGRAPHY: Senator Bartlett spoke from the floor of the Senate on Feb. 21, 1964, describing oceanographic work of the U. S. Coast Guard Cutter Northwind in the fall of 1963 during a cruise which extended into the East Siberian Sea and the Laptev Sea (Congressional Record, page 3202, Feb. 21, 1964).

Two newspaper articles describing some of the potential benefits from oceanographic research were inserted by Congressman King in the March 3, 1964, Congressional Record (Appendix pages A1057-1058).

A paper titled "Oceanic Research and Public Policy" delivered to the Governor's conference on "California and the World Oceans" in Los Angeles, Calif., Jan. 31, 1964, by a technical assistant to the Director, Office of Science and Technology, Office of the President, was inserted by Congressman Miller in the March 5, 1964, Congressional Record (Appendix pages A1132-1136). Included is a statement of the national oceanographic plan budget by actual Federal expenditures (by Agency) in fiscal year 1963, estimated expenditures in fiscal year 1964, and proposed expenditures in the President's budget for fiscal year 1965.

A newspaper article discussing some of the benefits which may be gained by oceanographic research was inserted by Congressman Wilson in the March 17, 1964 Congressional Record (Appendix page A1379).

PACIFIC ISLANDS TRUST TERRITORY DEVELOPMENT: The Subcommittee on Territories and Insular Affairs of the Senate Committee on Interior and Insular Affairs held hearings Feb. 28, 1964, on H. R. 3198, to promote the economic and social development of the

Trust Territory of the Pacific Islands, and for other purposes. The hearings were adjourned subject to call.

PASSAMAQUODDY TIDAL POWER PROJECT: H. R. 10179 (McIntire) and H. R. 10180 (Tupper) introduced in House Feb. 27, 1964, to authorize the international Passamaquoddy tidal power project, including hydroelectric power development of the upper Saint John River, and for other purposes; referred to Committee on Foreign Affairs.

PESTICIDES: Interagency Coordination in Environmental Hazards (Pesticides) (Hearings before the Subcommittee on Reorganization and International Organizations of the Committee on Government Operations, United States Senate, 88th Congress, 1st Session), Part 1, 390 pp., printed. Contains hearings held May 16, 22, 23 and June 4, 25, 1963, pursuant to S. Res. 27, 88th Congress, as amended. Included are statements from Federal officials, chemical industry representatives, and other public witnesses. The exhibits introduced at the hearings included several references to the effects of pesticides on fishery resources.

POLLUTION OF SEA BY OIL TREATY AMENDMENTS On Feb. 21, 1964, the Senate received Ex. Rept. No. 6, a favorable report from the Committee on Foreign Relations, on Executive C (88th Congress, 1st Session), Amendments of the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, adopted by a Conference of Contracting Governments convened at London on April 11, 1962.

On Feb. 25, 1964, Executive C. was read for the second time in the Senate (Congressional Record, pages 3352-3354) and ratified by a unanimous vote of 88 yeas. No House action required.

PRICE-QUALITY STABILIZATION: On Feb. 19, 1964, the Subcommittee on Quality Stabilization of the Senate Committee on Commerce concluded its hearings on S. 774, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution, and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes. On March 11, 1964, the bill was favorably reported, with amendment, to the full Committee by the Subcommittee on Quality Stabilization.

RESEARCH PROGRAMS: H. Rept. No. 1143, Federal Research and Development Programs (Feb. 17, 1964, First Progress Report of the Select Committee on Government Research, House of Representatives, 88th Congress, 2nd Session), 19 pp., printed. Contains (1) an overview of research and development; (2) summary of activities and investigative resources; (3) areas of committee inquiry (administration of research and development projects; facilities for research and development;

fiscal and contractual policies and procedures; impact of government research, student assistance in higher education; interagency coordination of research and development projects; statistical review of government research and development; documentation, dissemination, and use of research and development results; manpower for research and development; and national goals and policies); (4) preliminary research and development checklist; and appendix.

TRANSPORTATION AMENDMENTS OF 1963: Transportation Act Amendments--1963 (Hearings before the Surface Transportation Subcommittee of the Committee on Commerce, United States Senate, 88th Congress, 1st Session), Part 1 and Part 2, 1079 pp., printed. Contains hearings held on various dates in May, June, September, and October 1963, on S. 1061, a bill to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers, and for other purposes; and on S. 1062, a bill to provide for strengthening and improving the national transportation system, and for other purposes. Included are a letter from the President of the United States transmitting the proposed legislation; text of the proposed legislation and proposed amendments; Federal agency comments on the proposed legislation; and statements from other interested parties.

TRANSPORTATION AMENDMENTS OF 1964: H. Rept. No. 1144, Transportation Amendments of 1964 (February 18, 1964, report of the Committee on Interstate and Foreign Commerce, House of Representatives, 88th Congress, 2nd Session), 107 pp., printed. The Committee reported favorably H. R. 9903, to amend the Interstate Commerce Act and the Federal Aviation Act of 1958 so as to strengthen and improve the national transportation policy, and recommended passage of the bill. Contains purpose of the bill, what the bill does, background and need for legislation, section-by-section analysis, Presidential documents, changes in existing law, departmental reports, and the supplemental views of Representative Staggers dissenting in part with the Committee report.

WATER POLLUTION CONTROL ADMINISTRATION: On Feb. 19, 1964, the House Committee on Public Works concluded hearings on H. R. 3166, 9963, 4571, S. 649, and H. R. 6844, and related bills, to amend the Federal Water Pollution Control Act. Testimony was received from Congressmen and public witnesses. Speaking from the floor of the Senate on March 5, 1964, Senator Muskie reviewed the activities of the Advisory Commission on Intergovernmental Relations since its establishment in 1959, and announced that the Commission had filed its fifth annual report (Congressional Record, pages 4313-4315). Senator Muskie's remarks included a reference to a Commission report in 1962 which recommended some of the provisions incorporated in S. 649, a bill to establish in the Department of Health, Education, and Welfare, a Federal Water Pollution Control Administration, and for other purposes.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number | Title |
|----------|---|
| CFS-3356 | - Wisconsin Landings, September 1963, 2 pp. |
| CFS-3362 | - California Landings, August 1963, 4 pp. |
| CFS-3369 | - Virginia Landings, September 1963, 4 pp. |
| CFS-3370 | - Frozen Fishery Products, November 1963, 8 pp. |
| CFS-3381 | - California Landings, September 1963, 4 pp. |
| CFS-3383 | - Gulf Coast Shrimp Data, August 1963, 21 pp. |
| CFS-3385 | - Ohio Landings, September 1963, 3 pp. |
| CFS-3386 | - Virginia Landings, October 1963, 4 pp. |
| CFS-3387 | - Massachusetts Landings, June 1963, 10 pp. |
| CFS-3388 | - Maryland Landings, October 1963, 4 pp. |
| CFS-3391 | - Georgia Landings, November 1963, 3 pp. |
| CFS-3392 | - New Jersey Landings, October 1963, 4 pp. |
| CFS-3393 | - Fish Meal and Oil, November 1963, 2 pp. |
| CFS-3394 | - Florida Landings, November 1963, 8 pp. |
| CFS-3395 | - Frozen Fishery Products, December 1963, 8 pp. |
| CFS-3396 | - Rhode Island Landings, October 1963, 4 pp. |
| CFS-3397 | - South Carolina Landings, November 1963, 3 pp. |
| CFS-3398 | - Michigan Landings, October 1963, 3 pp. |
| CFS-3399 | - Wisconsin Landings, November 1963, 2 pp. |
| CFS-3400 | - Fish Sticks and Fish Portions, October-December 1963, 2 pp. |
| CFS-3401 | - Louisiana Landings, November 1963, 3 pp. |
| CFS-3402 | - New York Landings, November 1963, 4 pp. |
| CFS-3403 | - Virginia Landings, November 1963, 4 pp. |
| CFS-3404 | - Maryland Landings, November 1963, 4 pp. |
| CFS-3405 | - California Landings, October 1963, 4 pp. |
| CFS-3406 | - Maine Landings, November 1963, 4 pp. |
| CFS-3410 | - Georgia Landings, December 1963, 3 pp. |
| CFS-3411 | - South Carolina Landings, December 1963, 3 pp. |
| CFS-3413 | - Florida Landings, December 1963, 8 pp. |
| CFS-3418 | - Alabama Landings, November 1963, 4 pp. |
| CFS-3419 | - Rhode Island Landings, November 1963, 3 pp. |
| CFS-3422 | - Ohio Landings, October 1963, 3 pp. |
| CFS-3427 | - Wisconsin Landings, December 1963, 2 pp. |
- Sep. No. 701 - Gulf of Alaska Scallop Explorations--
1963
- FL-551 - Shrimp Farming, by Donald M. Allen, 8 pp., illus., October 1963. Gives an account of shrimp culture as it is practiced in Southeast Asia and suggesting possible application of techniques developed there to shrimp farming in the United States. Contains sections on the general life history of shrimp, culture methods, recommendations, and conclusions. In the United States, natural populations of shrimp occur in estuaries along the Gulf and South Atlantic coasts. This region appears well suited for shrimp farming, but commercial ventures in this field have been unsuccessful. If shrimp culture problems relating to seed supply, growth, survival, and harvesting can be resolved, and proven methods followed closely, Gulf and South Atlantic coastal marshes may support a new industry, states the author.
- SSR-Fish. No. 443 - Progress Report Spring Chinook Salmon Transplantation Study 1955-61, by Paul D. Zimmer, Roy J. Wahle, and Eugene M. Malzeff, 27 pp., illus., November 1963.
- SSR-Fish. No. 451 - A Method for Tagging Immature Herring, by John E. Watson, 10 pp., illus., August 1963.
- SSR-Fish. No. 457 - Physical Oceanographic Studies of Narragansett Bay, 1957 and 1958, by Steacy D. Hicks, 34 pp., illus., September 1963.
- SSR-Fish. No. 460 - Natural Variation in Spotting, Hyoid Teeth Counts, and Coloration of Yellowstone Cutthroat Trout, *Salmo clarki lewisi* Girard, by Ross V. Bulkeley, 14 pp., illus., July 1963.
- SSR-Fish. No. 462 - Mycobacteria in Adult Salmonid Fishes Returning to National Fish Hatcheries in Washington, Oregon, and California in 1958-59, by A. John Ross, 7 pp., July 1963.
- Fishery Bulletin of the Fish and Wildlife Service, vol. 63, no. 1, 1963, 258 pp., illus., printed. Contains the following articles, which are also available as reprints: "Identification of New England Yellowtail Flounder Groups," by Fred E. Lux; "Comparison of Growth of Four Strains of Oysters Raised in Taylors Pond, Chatham, Mass.," by William N. Shaw and James A. McCann; "Herring Tagging Experiments in Southeastern Alaska," by Bernard Einar Skud; "Model of the Migration of Albacore in the

North Pacific Ocean," by Tamio Otsu and Richard N. Uchida; "Further Studies on Fishway Slope and Its Effect on Rate of Passage of Salmonids," by Joseph R. Gauley and Clark S. Thompson; "Age, Growth, and Maturity of Round Whitefish of the Apostle Islands and Isle Royale Regions, Lake Superior," by Merryll M. Bailey; "Age and Growth of the Whitefish in Lake Superior," by William R. Dryer; "Influence of Water Velocity upon Orientation and Performance of Adult Migrating Salmonids," by Charles R. Weaver; "Development of a Mathematical Relationship between Electric-Field Parameters and the Electrical Characteristics of Fish," by Gerald E. Monan and Derek E. Engstrom; "Use of Plant Hemagglutinins in Serological Studies of Clupeoid Fishes," by Carl Sindermann; "Some Aspects of the Oceanography of Little Port Walter Estuary, Baranof Island, Alaska," by Charles F. Powers; "Early Larval Stages of the Seabob, *Xiphopeneus kroyeri* (Heller)," by William C. Renfro and Harry L. Cook; "Abundance, Age, and Fecundity of Shad, York River, Va., 1953-59," by Paul R. Nichols and William H. Massmann; "Cod Groups in the New England Area," by John P. Wise; "Distinguishing Tuna Species by Immunochemical Methods," by George J. Ridgway; "Theory on Development Mounds Near Red Bluff, Calif.," by Harold A. Gangmark and F. Bruce Sanford; and "Effect of Fishway Slope on Performance and Biochemistry of Salmonids," by Gerald B. Collins and others.

Operations of the Bureau of Commercial Fisheries under the Saltonstall-Kennedy Act, Fiscal Year 1962, 87 pp., illus., processed, August 1963. The eighth annual report to the Congress of the activities of the U. S. Bureau of Commercial Fisheries during the fiscal year ending June 30, 1962, under the provisions of the Saltonstall-Kennedy Act of July 1, 1954. Discusses commercial fishery progress in nationwide or international programs in technology, market news reporting, statistical reporting, marketing, foreign trade, and economics. In the Pacific Region, emphasis was placed on salmon and halibut abstention studies, the growing king crab fishery, biological studies of sockeye salmon, the salmon vs. dam controversy, grade standard development for sole and flounder fillets, bacteriological survey of Pacific filleting plants, and quality studies of Dungeness crab. The Gulf and South Atlantic Region reported a striped bass research program; menhaden research activities in sampling commercial catches for biostatistical and population analyses; research in shrimp biology, fishing gear and behavior; production of a shrimp trawling film; development of shrimp standards; shrimp quality studies; oyster and oyster drill studies; and calico scallop population studies. In the North Atlantic Region, activity centered around the Atlantic Herring Program encompassing early life history studies, age and growth studies, inshore habitat, herring migrations, disease research, development of blood group systems, and statistics of the catch. Other activities included Gulf of Maine temperature studies, ocean perch tagging, sea scallop stocks investigations, haddock and cod yield studies, research designed to improve trawling gear and methods, an effective oyster drill control program, oyster cultch studies, research on fish protein concentrate, school lunch and institutions programs, vessel safety activities, and participation in the FAO Fish in Nutrition Conference. Great Lakes and Central Region programs included Lake Erie biological research, limnology studies, Green Bay-Saginaw

Bay fish stocks research, technical assistance to trawl fisheries, technological work on thiaminase, technical advice on refrigeration and smoking techniques, establishment of the National Marketing Services Offices in Chicago, mink feed studies, and economic studies. Alaska Region activities emphasized sockeye salmon studies in Bristol Bay, Kvichak River, Nushagak River, Karluk Lake, and Kitoi Research Station; pink salmon studies at Little Port Walter and Olsen Bay; salmon streams and logging research; Southeast salmon stream catalog; Kasitsna Bay king crab studies; and research on crab meat production. In the California area, work went forward on sea surface temperature charts; sardine research in subpopulations, physiology, behavior, life history, and taxonomy; oceanographic and tuna contract research; tuna fishing strategy study; canned tuna specifications; and albacore catch analysis. There were no programs financed by S-K funds in the Hawaii Area during fiscal year 1962.

A Preview of the National Fisheries Center and Aquarium, 10 pp., illus., printed, 1963. Authorized by Act of Congress late in 1962, the Center is expected to be completed by about 1967. The \$10 million construction cost plus the annual costs of operating the Center will be recovered by admission fees. Research opportunities for scientists will be available in genetics, reproduction, nutrition studies, fish diseases, experimental ecology, behavior of aquatic organisms, antibiotics produced by marine animals, and other fishery problems. Fish will be displayed in pools and tanks. Movies and lectures on a variety of fishery subjects will be presented in the Center's auditorium.

Program of Research and Services for Alaska's Commercial Fisheries, Circular 171, 25 pp., illus., printed, October 1963. Discusses the Federal role in Alaska's fisheries, past and present; history of commercial fishing in Alaska; immediate problems--the international treaties situation, the declining salmon runs, the need for information, and the need for diversification of fishing effort; and foreseeable future problems--expansion of foreign fisheries, and human disturbance of salmon-spawning grounds. Outlines Bureau activities in Alaska in: biological research--knowledge of the environment, population dynamics, racial studies, and special studies of the effects of logging and other activities on fisheries; technological research; river basin studies; exploratory fishing and gear research; resource management; loans and grants; and statistics. Also covers planned future Bureau activities in marketing economics, information and education, and market news service; the tools to do the job; and what the Bureau's Alaska program will yield.

Your Recreation and the Fish and Wildlife Service, 8 pp., illus.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LABORATORY, BOX 3630, HONOLULU, HAWAII, 96812.

On the Oceanographic Conditions in the Southwestern Region of the Okhotsk Sea (2), by Makoto Wakao and Iori Kojima, 14 pp., illus., processed, November 1963. (Translated from the Japanese, Scientific Reports of the Hokkaido Fisheries Experimental Station, no. 1, March 1963, pp. 1-12.)

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, WYATT BLDG., SUITE 611, 777 14TH ST. NW., WASHINGTON, D. C. 20005.

| Number | Title |
|----------|--|
| MNL - 23 | Fisheries of Chile. Part I--North Chile, 1960-62 and Jan.-Sept. 1963, 52 pp. |
| MNL - 52 | Menhaden Fish Oil Prices--New York City, 1953-1963 and January 1964, 5 pp. |

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, October 1963, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 23369.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, January 1964, 13 pp. (Market News Service U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information January 1964, 8 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego, Calif. 92100.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, January 1964, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 1014, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, January 1964, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

List of Primary Receivers of Imported Fishery Products and Byproducts at New York, 1963, 22 pp., processed, January 1964. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.)

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, January 1964, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, December 1963, 21 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery port. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses, fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith) and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--December 1963, 20 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

Progress Report on Chemical Methods of Control of Molluscan Enemies, 20 pp., vol. 74, Bulletin No. 8, processed; November 1960. (U. S. Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Biological Laboratory, Milford, Conn.)

Report of Columbia River Fishery Program Office, Fiscal Years 1959-1960, 21 pp., illus., processed, 1961. U. S. Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Portland, Ore.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, January 1964, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges;

landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

Use of Chemical Barriers to Protect Shellfish Beds from Predators, by V. L. Loosanoff, C. L. MacKenzie, Jr. and L. W. Shearer, 11 pp., vol. 23, Bulletin no. 6, processed, 1959. (U. S. Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Biological Laboratory, Milford, Conn.)

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

"Artificial Light to Attract Young Perch: A New Method of Augmenting the Food Supply of Predaceous Fish Fry in Hatcheries," by George O. Schumann, article, The Progressive Fish-Culturist, vol. 25, no. 4, October 1963, pp. 172-174, printed, single copy 25 cents.

"Differential Survival of Rainbow Trout Fed Living Organisms and Hatchery Diets," by Edwin L. Cooper and Joseph H. Grosslight, article, The Progressive Fish-Culturist, vol. 25, no. 4, October 1963, pp. 193-197, printed, single copy 25 cents.

"The Effects of Copper Sulfate on Microcystis and Zooplankton in Ponds," by Johnie H. Crance, article, The Progressive Fish-Culturist, vol. 25, no. 4, October 1963, pp. 199-202, illus., printed, single copy 25 cents.

Equilibrium Yield and Management of Cutthroat Trout in Yellowstone Lake, by Norman G. Benson and Ross V. Bulkeley, Research Report 62, 50 pp., illus., printed, 35 cents, 1963.

"A New Ichthyosporidium Parasite of the Spot Leiostomus xanthurus: A Possible Answer to Recent Oyster Mortalities," by Frank J. Schwartz, article, The Progressive Fish-Culturist, vol. 25, no. 4, October 1963, pp. 181-186, illus., printed, single copy 25 cents.

"Oregon Pellets," by Wallace F. Hublou, article, The Progressive Fish-Culturist, vol. 25, no. 4, October 1963, pp. 175-180, printed, single copy 25 cents. Summarizes the production feeding results with the Oregon pellet (a fish food) from 1959 to 1963 at the Oregon Fish Commission's 16 salmon hatcheries.

"A Survey of Licensed Commercial Trout Hatcheries in Ontario," by Hugh R. McCrimmon and A. H. Berst, article, The Progressive Fish-Culturist, vol. 25, no. 4, October 1963, pp. 187-192, illus., printed, single copy 25 cents.

"A Unique Source of Warm-Water Fish for Restocking Managed Waters," by Russell A. Cookingham and Carleton Hudson, article, The Progressive Fish-Culturist, vol. 25, no. 4, October 1963, pp. 208-210, illus., printed, single copy 25 cents.

"A Utility Raft for Fishery Work," by Brian J. Rothchild, article, The Progressive Fish-Culturist, vol. 25, no. 4, October 1963, pp. 218-219, illus., printed, single copy 25 cents.

MISCELLANEOUS PUBLICATIONS

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ALASKA:

Alaska's Animals and Fishes, by Frank Dufresne, 314 pp., illus., printed, 1946. A. S. Barnes and Company, 232 Madison Ave., New York 16, N. Y.

The Kingdom of the Seal, by Francis M. Menager, 222 pp., illus., printed, 1962. Loyola University Press, 3441 N. Ashland Ave., Chicago 13, Ill. An account of a missionary's experiences among Alaskan eskimos. Includes some information on sealing and a chapter on subsistence fishing.

ALMANAC:

The American Ephemeris and Nautical Almanac for the Year 1965, 519 pp., illus., printed, \$3.75, 1963. Nautical Almanac Office, U. S. Naval Observatory, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Presents information relating to the sun, moon, planets, stars, eclipses, ephemerides, and satellites for the year 1964.

ASCORBIC ACID:

"Studies on Ascorbic Acid in Fish Tissues," by P. Ambuja Bai and M. Kalyani, article, Journal of Animal Morphology and Physiology, vol. 7, no. 2, 1960, pp. 162-166, printed. Journal of Animal Morphology and Physiology, Bombay, India.

AUSTRALIA:

Foreign Trade Regulations of Australia, by Dane M. Black, OBR 63-129, 12 pp., printed, 15 cents, October 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) A report on Australia's foreign trade regulations was issued recently by the U. S. Department of Commerce. The Government's policy is to offer protection under the customs tariff to "economic and efficient" local industries. The report discusses Australian trade policy, import tariff system, sales and other internal taxes, customs documentation, and labeling and marking requirements. It also covers special customs provisions, nontariff import trade controls, Australia's export controls, United States import and export controls, and diplomatic representation between the two countries.

Report by the Chief Secretary on Fisheries in New South Wales, for the Year Ended 30th June, 1962, 15 pp., printed, 1963. Office of the Chief Secretary (Parliament), Sydney, Australia.

Southern Pelagic Project Six-Monthly Review, No. 5 October 1963, 9 pp., processed. Southern Pelagic

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Project Laboratory, Camberwell, Victoria, Australia. Discusses research vessel operations, field operations and intelligence unit, tuna research, Australian salmon research, spiny lobster research, and catch sampling.

BACTERIOLOGY:

"Las Bacterias y los Seres Marinos" (Bacteria and Marine Life), article, Puntal, vol. X, no. 113, August 1963, pp. 10-11, printed in Spanish, single copy 12 ptas. (about 20 U. S. cents). Puntal, Apartado de Correos 316, Alicante, Spain.

BASS:

Catch Records from the Striped Bass Sportfishery in California, by Harold K. Chadwick, 26 pp., illus., printed. (Reprinted from California Fish and Game, vol. 48, no. 3, July 1963, pp. 153-177.) Printing Division, Documents Section, Department of Fish and Game, N. Seventh St. at Richards Blvd., Sacramento 14, Calif.

BIOCHEMISTRY:

"Comparison of Chemical and Organoleptic Data Obtained on Thawed and Unthawed Frozen Cod, Haddock, and Perch Fillets," by Fred Hillig and others, article, Journal of the Association of Official Agricultural Chemists, vol. 46, June 1963, pp. 493-517, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

BIVALVES:

Common Marine Bivalves of California, by John E. Fitch, Fish Bulletin No. 90, 107 pp., illus., printed, 1953. Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

BLACK CROAKER:

"Life-History and Ecologic Notes on the Black Croaker," by Conrad Limbaugh, 12 pp., illus., printed. (Reprinted from California Fish and Game vol. 47, no. 2, April 1961, pp. 163-174.) Printing Division, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

BRAZIL:

"Erradicacao de Piranhas no Acude Publico 'Pocoda Cruz'-Inaja, Pernambuco--Ostariophisi, Characidae, Serrasalminae. 1--Reconhecimento da Bacia Hidrografica (1)" (Eradication of Piranhas in the Poco da Cruz Public Dam--Inaja, Pernambuco--Ostariophisi, Characidae, Serrasalminae. 1--Survey of the Hydrographic Basin), by R. Adhemar Braga, article, Boletim do Museu Nacional, Zoologia no. 226, May 31, 1961, pp. 1-32, illus., printed in Portuguese with English summary. Servico de Piscicultura do D.N.O.C.S., Av. do Imperador, 1313, Cx. Postal 25, Fortaleza, Ceara, Brazil. The general objective of the survey was to verify the possibility of eradicating piranhas in the Poco da Cruz Dam. Findings showed that eradication was possible and could be done in 3 to 4 months with 5 percent Rotenone.

BYPRODUCTS:

"Nutritional Value of Fish Products Told. Part I--Fish Products in Poultry Rations," by Elbert J. Day; "Part II--Amino Acid Adequacy, Protein Efficiency," by G. Richard Childs; and "Part III--Methodology in

the Nutritional Evaluation of Protein (for Poultry)," by Hans Fisher, articles, Feedstuffs, vol. 35, April 6, 1963, pp. 20, 75, printed. Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis 5, Minn.

CALIFORNIA:

California Fish and Game, vol. 49, no. 4, October 1963, 97 pp., illus., printed, single copy 75 cents. Printing Division, Documents Section, Department of Fish and Game, Sacramento 14, Calif. "Food of Young-of-the-Year Striped Bass (Roccus saxatilis) in the Sacramento-San Joaquin River System," by William Heubach, Robert J. Toth, and Alan M. McCready; "Fishes Collected in the Eastern Pacific during Tuna Cruises, 1952 through 1959," by Harold B. Clemens and John C. Nowell; "Mass Mortality of Marine Organisms Attributed to the 'Red Tide' in Southern California," by Donald J. Reish; "Egg-Cases of Some Elasmobranchs and a Cyclostome from Californian Waters," by Keith W. Cox; "Age and Length Composition of the Sardine Catch Off the Pacific Coast of the United States and Mexico in 1960-61," by Robert S. Wolf and Anita E. Daugherty; "Preliminary Age Determination of Bluefin Tuna, Thunnus thynnus," by Robert R. Bell; and "Migration of a Tagged Bluefin Tuna Across the Pacific Ocean," by Craig J. Orange and Bernard D. Fink.

Common Ocean Fishes of the California Coast, by Phil M. Roedel, Fish Bulletin No. 91, 181 pp., illus., printed, 1953. Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

"Estimating the Number of Angling License Purchasers," by Norman J. Abramson, 3 pp., printed. (Reprinted from California Fish and Game, vol. 48, no. 4, October 1962, pp. 253-255.) Printing Division, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

"Mission Bay, a Review of Previous Studies and the Status of the Sportfishery," by Gordon A. Chapman, 14 pp., printed. (Reprinted from California Fish and Game, vol. 49, no. 1, January 1963, pp. 30-43.) Printing Division, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

The Names of Certain Marine Fishes of California, by Phil M. Roedel, 18 pp., printed. (Reprinted from California Fish and Game, vol. 48, no. 1, January 1962, pp. 19-34.) Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento, Calif.

Ocean Fishing Map of San Francisco, San Mateo and Santa Cruz Counties and the Elkhorn Slough Area of Monterey County, accordion-folded booklet, illus., printed. Conservation Education, Department of Fish and Game, 722 Capitol Ave., Sacramento, Calif.

"An Outline of California Fishing Gear," by W. L. Scofield, 10 pp., illus., printed. (Reprinted from California Fish and Game, vol. 37, no. 4, October 1951, pp. 361-370.) Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

"A Sea Urchin, a Lobster and a Fish, New to the Marine Fauna of California," by John E. Fitch, 6 pp., illus., printed. (Reprinted from California Fish and Game, vol. 48, no. 4, October 1962, pp. 216-221.)

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Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

CANADA:

"Canadian Summer Fisheries--1963," article, Trade News, vol. 16, no. 4, October 1963, pp. 6-9, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. In the Maritimes and Quebec, all the summer fisheries started well except lobstering and by the end of June the total catch was ahead in both volume and value. Plans were announced for the construction of 2 fish-processing plants in Nova Scotia and 2 in Prince Edward Island. Despite strikes on the Pacific Coast, good catches of halibut and other groundfish were made, although halibut prices were down because of large stocks carried over from the previous season. Salmon landings were fair but the season's pack to the end of August amounted to only a little more than half that of 1962. The fresh-water fisheries season ended with markets and prices firming and plans being made for more fish to be frozen and packed in the Arctic areas. Shipment of live food fish from northern Ontario to the United States failed to meet the demand because of short supply.

A Review of the Strait of Georgia Trawl Fishery, by C. R. Forrester and K. S. Ketchen, Bulletin No. 139, 93 pp., printed, 1963. Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

CANNING:

"Fiskehermetikindustrien i Spania Enkelte Andre Land" (Fish Canning Industry in Spain and a Few Other Countries), by B. Lovas-Svendson, article, Tidsskrift for Hermetikindustri, vol. 49, no. 11, November 1963, pp. 431-432, 434, illus., printed in Norwegian. Norske Hermetikfabrikers Landsforening, Stavanger, Norway.

CARRAGEENIN:

"The Antithrombic Activity of Carrageenin in Human Blood," by W. W. Hawkins and Verna G. Leonard, article, Canadian Journal of Biochemistry and Physiology, vol. 41, May 1963, pp. 1325-1327, printed. National Research Council, Ottawa, Canada. Carrageenin is a sulfated galactan present in the red seaweeds Chondrus and Gigartina.

CATFISH:

"A Close Look at One of Tennessee's Leading Families and Its Problems," by John Conder, article, The Tennessee Conservationist, vol. XXXI, no. 11, November 1963, pp. 8-9, 13, illus., printed. Game and Fish Commission, 264 Cordell Hull Bldg., 436 Sixth Ave. N., Nashville, Tenn.

CEPHALOPODS:

Cephalopods of the Philippine Islands, by Gilbert L. Voss, Bulletin 234, 184 pp., illus., printed, \$1, 1963. Smithsonian Institution, U. S. National Museum, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.)

CETACEANS:

Damage Caused by Porpoises and Other Predatory Marine Animals, by C. Ravel, GFCM Studies and

Reviews No. 22, 10 pp., processed, November 1963. General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. Discusses locations near Mediterranean countries where porpoises and dolphins are most often encountered; damage caused to nets by these animals; and methods used to control them. Since their meat is edible, market promotion of these species might result in a demand which would reduce their numbers.

CHLOROPHYLL:

Distribution of Chlorophyll in the Straits of Florida, by James E. Alexander and E. F. Corcoran, Contribution No. 450, 4 pp., illus., printed. (Reprinted from Limnology and Oceanography, vol. 8, no. 2, April 1963, pp. 294-297.) The Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

CLAMS:

"Histology of the Reproductive System of the Soft-Shell Clam (Mya arenaria)," by Alden P. Stickney, article, The Biological Bulletin, vol. 125, no. 2, October 1963, pp. 344-351, illus., printed, single copy \$2.50. Marine Biological Laboratory, Woods Hole, Mass.

"Low-Cost Clam Purification System is Promising," by R. Anthony Barnes, article, National Fisherman/Maine Coast Fisherman, vol. 44, June 1963, pp. 33, 37, printed. Journal Publishing Co., Belfast, Me.

"The Pismo Clam in 1960," by John L. Baxter, 5 pp., printed. (Reprinted from California Fish and Game, vol. 48, no. 1, January 1962, pp. 35-37.) Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento, Calif.

"The Incidence of Malacobdella grossa in Hard Clams from Nantucket Sound, Massachusetts," by John W. Ropes, article, Limnology and Oceanography, vol. VIII, no. 3, July 1963, pp. 353-355, illus., printed. American Society of Limnology and Oceanography, Lawrence, Kans.

The Pismo Clam, by John E. Fitch, Marine Resources Leaflet No. 1, 24 pp., illus., processed, 1961. Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif.

"Seasonal Variation in Chemical Composition of Clam (Tapes pullastra Mont)," by G. Alvarez-Seoane, article, Investigacion Pesquera, no. 17, 1960, pp. 3-32, printed in Spanish. Instituto de Investigaciones Pesqueras, Paseo Nacional, s/n, Barcelona-3, Spain.

COLOMBIA:

"Como Se Evade Nuestra Riqueza Pesquera" (How Our Fishery Wealth Is Wasted), by Tristan del Cauca, article, Puntal, vol. X, no. 113, August 1963, pp. 16-19, illus., printed in Spanish, single copy 12 ptas. (about 20 U. S. cents). Puntal, Apartado de Correos 316, Alicante, Spain.

CONTAINERS:

"Iron Sulfide Blackening in Canned Protein Foods: Oxidation and Reduction Mechanisms in Relation to Sulfur and Iron," by George M. Pigott and Alexander M. Dol-

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lar, article, Food Technology, vol. 17, April 1963, pp. 115-118, printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

"The Mechanism of Iron Sulfide Discoloration in Cans of Shrimp," by Mary H. Thompson, article, Food Technology, vol. 17, May 1963, pp. 157-163, printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

DENMARK:

Fiskeriårbogen 1964 (The Fisheries Yearbook, 1964), edited by J. Fr. Simony, 815 pp., illus., printed in Danish, 14.17 kr. (about US\$2.05), December 1963. Iver C. Weilbach & Company, Amaliegade 30, Copenhagen, Denmark. A comprehensive collection of information on navigation, fishery rules and regulations, inspection, and related topics, primarily for Danish, Faroese, and Greenland fishermen, but it is also used by yachtsmen and small craft. Issued annually by the Ministry of Fisheries about the first of the year, the current issue is the 71st edition. The major sections are: (1) 1964 calendar--navigation tables, courses, and distances; (2) rules of navigation and carrying of lights--harbor bylaws, buoyage, precautions with respect to submarine cables, light and signal stations, radiotelephony and telegraphy; (3) acts and regulations governing the fishing industry--control of quality and exports of fish, fisheries statistics, and shipping; (4) index of fishing vessels, harbor signal letters; (5) acts and regulations governing inspection of ships, ship construction and equipment, medical supplies, and medical examination of crew; (6) fishery inspection, quarantine regulations; (7) accident insurance; (8) acts concerning loans to the fishing industry; (9) acts and regulations on hunting; (10) guidance on shipwrecks and accidents; (11) institutions and addresses; (12) fish names and market classifications, courses, measures and weights; and (13) stability of fishing vessels. There is also a detailed alphabetical index of the subject matter, and a list, by type of product, of the numerous fishery trade advertisements in the Yearbook. The final section is an article entitled "Stability of Fishing Vessels," by Leo Retvig, of the Directorate for the Government's Ship Inspection. This is a review of research on stability and stability conditions in fishing vessels, stimulated by the loss of a number of Danish steel fishing cutters in February and the Autumn of 1963. The article is divided into sections on stability, background, inclining tests and stability, rolling tests, wood and steel, and demand for stability research.

--Andrew W. Anderson

DRYING:

"New Fish Drying Plant," article, World Fishing, vol. 12, May 1963, pp. 37, 46, printed. John Trundell and Partners Ltd., St. Richard's House, Eversholt St., London NW., England.

ECOLOGY:

Marine Distributions, by M. J. Dunbar, 118 pp., illus., printed, \$5, 1963. University of Toronto Press, Toronto, Canada.

EELS:

A Smoked Eel Industry in Victoria, by D. D. Lynch, Fisheries Circular No. 8, 11 pp., illus., processed,

October 1962. Fisheries and Wildlife Department, 605 Flinders St., Melbourne C3, Australia.

ELECTRICAL FISHING:

"Après le Congrès Mondial des Pêches (Suite): De la Technique Soviétique à la Pêche à l'Électricité" (After the World Congress of Fisheries: On the Soviet Technique of Electrical Fishing), by R. Lemaire, article, France Pêche, no. 77, October 1963, pp. 39-41, printed in French, single copy 2.5 F (about 50 U.S. cents). France Pêche, Boite Postale 179, Lorient, France.

"Electric Fishing--A Practical Application," article, World Fishing, vol. 12, April 1963, p. 35, printed. John Trundell and Partners Ltd., St. Richard's House, Eversholt St., London NW1, England.

EUROPEAN ECONOMIC COMMUNITY:

Statistique des Pêches (Fishery Statistics, 1950-1961), 75 pp., printed in French and German, 1963. Communauté Economique Européenne, Office Statistique, Brussels, Belgium.

FAUNA:

Life Along the Seashore, by Alan Solem, 32 pp., illus., printed, 99 cents, 1963. Encyclopaedia Britannica Press, 425 N. Michigan Ave., Chicago 11, Ill.

FINANCIAL ASSISTANCE:

Financial Assistance Policies and Administration for Fishery Industries, by E. S. Holliman, Fisheries Studies No. 11, 130 pp., printed, \$1, 1962. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. This study was undertaken in response to a recommendation of the Technical Meeting on Credit for Fishery Industries held in Paris, October 17-22, 1960. The principal objective of this meeting, organized by the Food and Agriculture Organization of the United Nations (FAO), was to provide a forum for an exchange of views and experience in the organization, administration, and evaluation of fishery credit systems in FAO member countries. The report covers objectives of fishery credit policies in developed and developing countries, implications of policy objectives on the nature and scope of credit assistance, and the measurement of needs. Also discusses the form of assistance, organization of financial assistance, administration of aid programs, and coordination and review of fishery credit policies.

FISH BEHAVIOR:

"Concentrating Factors in Fisheries," by P.M.J. Woodhead, article, World Fishing, vol. 12, May 1963, pp. 63-64, 67-68, printed. John Trundell and Partners Ltd., St. Richard's House, Eversholt St., London NW1, England.

Conditioned Avoidance Learning in Two Fish Species, by Leon S. Otis and Jean A. Cerf, 4 pp., printed, April 18, 1963. (Reprinted from Psychological Reports, vol. 12, 1963, pp. 679-682.) Stanford Research Institute, Menlo Park, Calif.

"Electronically Scanned Sonar in the Investigation of Fish Behaviour," by V. G. Welsby, J.H.S. Blaxter, and C.J. Chapman, article, Nature, vol. 199, no. 4897, September 7, 1963, pp. 980-981, illus., printed, single

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copy 4s. (about 55 U. S. cents). St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

"The Visual Sense of Pelagic Fishes Especially the Visual Axis and Accommodation," by Tamotsu Tamura and Warren J. Wisby, article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 13, no. 3, September 1963, pp. 433-447, printed in English with Spanish summary. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Virginia Key, Miami 49, Fla.

FISH COOKERY:

"Time-Temperature Studies of Baked Loaves (Meat, Fish, and Poultry)," by Karla Longree and others, article, Journal of the American Dietetic Association, vol. 42, June 1963, pp. 500-504, printed. American Dietetic Association, 620 North Michigan Ave., Chicago 11, Ill. Describes an investigation to study the effect of various time and temperature combinations used in baking: beef loaf with raw meat; salmon loaf made with canned fish; and turkey loaf made with cooked meat; whole egg solids were used as the binder. Purpose was to determine the bacteriologic safety of products using whole egg solids.

FISHERY ECONOMICS:

"Place of Economics in Fisheries," by G. M. Gerhardsen, article, Fishing News International, vol. 2, April-June 1963, pp. 198-200, printed. A. J. Heighway Publications Ltd., 110 Fleet Street, London EC4, England.

FISHERY RESEARCH:

Computer Programs for Fisheries Problems, 2 pp., Fisheries Circular No. 7, processed, 1963. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

FISH LIVER OIL:

"Seasonal Variations in Cod Liver Oil," by K. W. DeWitt, article, Journal of the Science of Food and Agriculture, vol. 14, February 1963, pp. 92-98, printed. Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

FISH MEAL:

"Chemical and Nutritional Changes in Stored Herring Meal. 4--Nutritional Significance of Oxidation of the Oil," by K. J. Carpenter, article, British Journal of Nutrition, vol. 17, no. 2, 1963, pp. 151-169, printed. Cambridge University Press, 200 Euston Rd., London NW1, England.

"Simple Method for Producing Highly Nutritious Fish Meal," by A. Valente de Fonseca Alves da Costa, article, Boletim da Pesca, vol. 13, no. 72, 1961, pp. 55-56, printed in Portuguese. Gabinete de Estudos das Pescas, 644 R.S. Bento, Lisbon, Portugal.

"Studies on the Value of Bone Meal and Fish Meal as Phosphatic Fertilizers," by M. O. Ghani, K. A. Hasan, and M. A. Mannan, article, Pakistan Journal of Biological and Agricultural Sciences, vol. 4, no. 1, 1962, pp. 44-52, printed. Pakistan Journal of Biological and Agricultural Sciences, Dacca, Pakistan.

FISH OILS:

"On the Structure of Highly Unsaturated Fatty Acids of Fish Oils by High Resolution Nuclear Magnetic Resonance Spectral Analysis," by Tetsutaro Hashimoto and others, article, Journal of the American Oil Chemists' Society, vol. 40, April 1963, pp. 124-128, printed. American Oil Chemists' Society, 35 E. Wacker Dr., Chicago 1, Ill.

FISH POPULATIONS:

Concerning the Causes of Fluctuations in the Abundance of Fishes, by G. V. Nikolsky, Translation Series No. 389, 11 pp., processed, 1962. (Translated from the Russian, Voprosy Ikhtiologii, vol. 1, no. 4 (21), 1961, pp. 659-665.) The Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

Demographic Diagnosis on Fish Populations in Trout Streams, by R. Cuinat and R. Vibert, GFCM Studies and Reviews No. 21, 30 pp., illus., processed, October 1963. General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

FISH SOLUBLES:

"Unidentified Chick Growth Factor in Fish Solubles," by F. H. Steinke, H. R. Bird, and F. M. Strong, article, Journal of Nutrition, vol. 80, May 1963, pp. 60-68, printed. American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

FOOD AND AGRICULTURE ORGANIZATION:

Bulletin of Fishery Statistics, vol. 1--Landings by Species, 1937-38, 1947-61, 205 pp., processed, 1963. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. This publication will be issued from time to time in a limited number of copies to supplement the tables and text of the Yearbooks of Fishery Statistics, to circulate new tables on a trial basis prior to their incorporation in the Yearbooks, and also to present detailed statistics of regional interest, statistics on selected fishery commodities, and special tabulations for meetings and working parties. This issue contains, in an extensively revised form, for 2 prewar years and 15 postwar years, landings statistics for approximately 170 species items broken down by country. Includes summary data on landings of aquatic animals and plants by divisions and by groups of species and landings by groups of species and by species; and landings by species and by country of fresh-water and diadromous fish, marine fish, and crustaceans, molluscs, and other invertebrates. Data for whales, seals, and miscellaneous aquatic mammals, miscellaneous aquatic animals and residues, and aquatic plants are not covered.

The State of Food and Agriculture, 1963, 227 pp., printed, 1963. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

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culture Organization of the United Nations, Rome, Italy. (Sold in United States by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) This edition contains fishery statistics on catch and landings by quantity and value, production of preserved and processed commodities, fishing craft, and whaling from all countries. The total nominal catch of fish, crustaceans and molluscs and other aquatic animals except seals and whales, residues and aquatic plants, throughout the world in 1962 is estimated at over 44 million metric tons, an increase of 7 percent over the nominal catch of 1961, and is once more greater than in any other year. Out of the total of over 44 million tons nearly 12 million tons were used for the manufacture of fish meals for animal feeding and about another million for miscellaneous purposes. The balance of about 32 million tons was used for human food in fresh, frozen, cured, or canned form.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Program for Technical Assistance for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

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Second Report to the Government of Guatemala on Development on Inland Fisheries, by S. Y. Lin, EPTA Report No. 1719, 48 pp., processed, 1963.

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1963. Secretariat General de la Marine Marchande, Direction des Peches Maritimes, Paris, France.

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A Directory of Freeze-Drying: Food Processors, Equipment Firms, and Others, by Kermit Bird, 10 pp., processed, revised October 1963. Division of Information, Office Of Management Services, U. S. Department of Agriculture, Washington, D. C., 20250. Lists the names and addresses of 13 United States and Canadian and 23 foreign freeze-dry food processors, together with a description of the types of foods processed. Also includes names and addresses of 16 United States and Canadian and 11 foreign freeze-dry equipment manufacturers, and a description of the type of equipment produced. The final section lists names and addresses and types of businesses of 22 miscellaneous domestic and foreign firms, including handlers of freeze-dried foods, processors of non-food items, manufacturers of controls, and others.

Freeze-Dried Foods and the Frozen Food Industry, by Kermit Bird, 24 pp., illus., processed, October 1963. Division of Information, Office of Management Services, U. S. Department of Agriculture, Washington, D. C., 20250. Discusses the freeze-drying process and its advantages and disadvantages; major markets for freeze-dried foods; quality of freeze-dried foods as compared with frozen foods; costs of the freeze-drying process; expected freeze-drying volumes; and the future of freeze-drying. Includes statistical tables presenting data on taste tests of freeze-dried and frozen shrimp, crab, and other foods; estimates of capacity, investment, and costs of a typical freeze-drying plant; average costs of freeze-dry processing of shrimp and 3 other foods; length of processing season and average freeze-drying costs per pound of water; and anticipated increases in refrigeration needs caused by freeze-drying industry in 1967.

"Freeze Dry Continuously," article, Food Processing, vol. 24, June 1963, pp. 68-72, printed. Putman Publishing Company, 111 E. Delaware Pl., Chicago 11, Ill.

"Die kontinuierliche Gefriertruocknung von Lebensmitteln" (Continuous Freeze Drying of Foodstuffs), by U. Hackenberg, article, Dechema Monographien, vol. 46, nos. 761-780, 1963, pp. 161-171, illus., printed in German. Rhengai-Allee 25, Frankfurt, Germany.

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Handling Inshore Fish, by J. J. Waterman, Torry Advisory Note no. 11, 3 pp., printed, 1963. Torry Research Station, 135 Abbey Rd., Aberdeen, Scotland.

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"Studies on Fish Hemoglobins Chinook Salmon and Rainbow Trout," by Donald R. Buhler, article, Journal of Biological Chemistry, vol. 238, May 1963, pp. 1665-1674, printed. American Society of Biological Chemists, 428 East Preston St., Baltimore 2, Md.

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(North Pacific Fur Seal Commission) Proceedings of the Sixth Annual Meeting, November 26-December 3, 1962, Washington, D. C., 36 pp., processed. Secretary, North Pacific Fur Seal Commission, U. S. Fish and Wildlife Service, Washington, D. C., 20240. The North Pacific Fur Seal Commission was established in January 1958, during a meeting held in Washington, D. C. The Commission was organized pursuant to the Interim Convention on Conservation of North Pacific Fur Seals, signed in Washington, D. C., on February 9, 1957, by the Governments of Canada, Japan, the U.S.S.R., and the United States. The Convention came into force on October 14, 1957. This report contains a summary of the proceedings of the Sixth Annual Meeting, a report of the Standing Scientific Committee, a list of participants attending the meeting, summaries of fur-seal investigations during 1962, plans for investigations during 1963, and administrative report of the Secretary to the Sixth Meeting.

IRRADIATION PRESERVATION:

"Changes in the Microflora of Haddock Fillets and Shucked Soft-Shell Clams After Irradiation with

Co⁶⁰ Gamma Rays and Storage At 0 C. and 6 C.," by E. B. Masurovsky, J. S. Voss, and S. A. Goldblith, article, Applied Microbiology, vol. 11, May 1963, pp. 229-234, printed. Williams and Wilkins Co., 428 East Preston St., Baltimore 2, Md. Data were previously presented on the micro-organisms obtained from shucked soft-shelled clams and haddock fillets before and, at various periods of time, after irradiation with Co⁶⁰ gamma rays and storage at 0° and 6° C. This report presents the changes that took place in the constitution of the microflora of these marine products as the microbial population increased, and then they correlated these findings with such deleterious effects as spoilage and discoloration. They also searched for micro-organisms of public health significance in the hope that any problems associated with such microbes in radiation-treated seafoods might be brought into clearer perspective.

"Effect of Substerilization Doses of Co⁶⁰ Gamma Radiation on the Cold-Storage Life Extension of Shucked Soft-Shell Clams and Haddock Fillets," by E. B. Masurovsky, S. A. Goldblith and J. T. R. Nikerson, article, Applied Microbiology, vol. 11, May 1963, pp. 220-228, printed. Williams and Wilkins Co., 428 East Preston St., Baltimore 2, Md.

"Food Preservation by Radiation, Its Present Status--Its Future Potential," by Samuel A. Goldblith, article, Food Engineering, vol. 35, May 1963, pp. 49-52, printed. Chilton Co., Chestnut and 56th Sts., Philadelphia 39, Pa.

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Bulletin of the Hokkaido Regional Fisheries Research Laboratory, no. 27, September 1963, 85 pp., illus., printed in Japanese with English summaries. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan. Contains, among others, articles on: "Male and Female Catches of the Pacific Salmon by the Japanese High Seas Fisheries," by T. Ishida; "Mesh Selective Biases on the Gill-Net Caught Sockeye and Chum Salmon," by T. Ishida; "Biochemical Studies on Squid. XXI--Re-Examination on the Crude Fat Content of Squid Meat," by K. Kitabayashi and others; "XXII--Inactivation of Trypsin by the Water Extract of Squid Meat," by S. Ishikawa and K. Kitabayashi; and "Studies on Fungi Isolated from Marine Products. III--Influence of Various Food Additives on the Growth of Fungi Isolated from Smoked Squid (1)," by Y. Okunda and T. Sato.

JELLYFISH:

Notes on Freshwater Jellyfish in Ontario, by Glenn B. Wiggins, R. E. Whitfield, and F. A. Walden, No. 45, 6 pp., printed, January 15, 1957. Contributions of the Royal Ontario Museum, Division of Zoology and Palaeontology, 100 Queen's Park, Toronto, Canada.

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"History of Kelp Harvesting in California," by W. L. Scofield, 24 pp., illus., printed. (Reprinted from California Fish and Game, vol. 45, no. 3, July 1959, pp. 135-157.) Printing Office, Documents Section, Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

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"L'Avenir de la Peche et de la Consommation du Poisson Frais" (The Prospects for the Fishery and for the Consumption of Fresh Fish), by M. Keller, article, France Peche, no. 77, October 1963, pp. 29-32, illus., printed in French, single copy 2.5 F (about 50 U.S. cents). France Peche, Boite Postale 179, Lorient, France.

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"A New Pleuromariid Gastropod Trawled in the Straits of Florida by R/V Gerda," by Frederick M. Bayer, Contribution No. 494, 5 pp., illus., printed in English with Spanish summary. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 13, no. 3, September 1963, pp. 488-492.) The Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

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Trolling Gear in California, by W. L. Scofield, Fish Bulletin 103, 45 pp., illus., printed, 1956. Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

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Fins and Tails: A Story of Strange Fish, by Elizabeth A. Campbell, 60 pp., illus., printed, \$3, 1963. Little, Brown and Co., 34 Beacon St., Boston 6, Mass.

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Berichte der Deutschen Wissenschaftlichen Kommission für Meeresforschung, Neue Folge, Band XVII, Heft 2, July 1963, 91 pp., illus., printed in German with English summaries. E. Schweizerbart'sche Verlagsbuchhandlung (Nägele u. Obermiller), Stuttgart, Germany. Contains articles on: "Biologisch-Statistische Untersuchungen über die Deutsche Hochseefischerei. IV--Die Entwicklung der Hochseefischerei in Fangtechnischer, Räumlicher und Biologischer Hinsicht. 7--Ertrags- und Bestandsveränderungen bei den Nutzfischen" (Biological-Statistical Research on German Deep Sea Fishing. IV--Development of Deep

Sea Fishing with Regard to the Technique, the Area, and Biological Considerations of the Catch. 7--Changes in Yield and Stock of Commercial Fishes), by Johannes Lundbeck; and "Über das Wachstum des Steinbutts (Scophthalmus maximus L.) in der Nordsee" (On the Growth of the Turbot--Scophthalmus maximus L.--in the North Sea), by Tekin Mengi.

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A Guide to the Grunion, by Boyd W. Walker, 12 pp., illus., printed. (Reprinted from California Fish and Game, vol. 38, no. 3, July 1952, pp. 409-420.) Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

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Preparing Shipments to Guinea, OBR 63-130, 8 pp., printed, 15 cents, October 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) Gives information on requirements for shipping documents; import regulations; mail shipment rules; and labeling, marking, and packing requirements. Also discusses entry, transit, and warehousing of goods; reexportation and free admission; customs procedures; and Guinean Government representation in the United States.

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Circulation and Water Mass Distribution in the Gulf of Mexico, by T. Ichiye, Contribution No. 190, printed, 1962. Oceanographic Institute, Florida State University, Tallahassee, Fla.

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Summary Review of the Lake Erie Commercial Fish Catch Since the Beginning of Records, 52 pp., printed, 1962. Water Resources Commission, Lansing, Mich.

MARINE BIOLOGY:

AIBS Bulletin, vol. 13, no. 5, October 1963, 107 pp., illus., printed, single copy \$2. American Institute of Biological Sciences, 2000 P St. NW., Washington 6, D. C. This is a special issue devoted to various aspects of marine biology. The section on "National agencies--interest and support," covers the Office of Naval Research, Bureau of Sport Fisheries and Wildlife, U. S. Atomic Energy Commission, Bureau of Commercial Fisheries, National Science Foundation, Smithsonian Institution, Public Health Service, and National Oceanographic Data Center. The section on research and education discusses needs for research and education, and the readiness of aquatic biology for the computer age. The section on international cooperation gives information on the EQUALANT cruises and the International Indian Ocean Expedition. The final section covers research problems of marine organisms, marine bacteriology, phytoplankton and primary production, zooplankton and the food cycle, the deep sea benthos, larval development, pelagic fishes, and the improvement of

world fisheries from the biologist's and from the oceanographer's viewpoints.

MARINE MAMMALS :

"The Sea Lions, Seals and Sea Otter of the California Coast," by Paul Bonnot, 19 pp., illus., printed. (Reprinted from California Fish and Game, vol. 37, no. 4, October 1951, pp. 371-389.) Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

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"Progress in Marine Oil Research Conducted and Sponsored by the United States Bureau of Commercial Fisheries," by Neva L. Karrick, article, News Summary No. 10, December 1962, pp. 92-112, printed. International Association of Fish Meal Manufacturers, 70 Wigmore St., London W1, England.

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"North Pacific Treaty Negotiations," article, Trade News, vol. 16, no. 4, October 1963, p. 5, processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

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"A Range Extension for the Mexican Scad to Monterey Bay, California," by Herbert W. Freay, 2 pp., printed. (Reprinted from California Fish and Game, vol. 48, no. 3, July 1962, pp. 210-211.) Printing Division, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

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"The Effect of Salinity on the Temperature Tolerance of Eggs and Larvae of Some Lamellibranch Mollusks," by Harry C. Davis, 1 p., printed. (Reprinted from Proceedings of the XVI International Congress of Zoology, Washington, D. C., August 20-27, 1963, vol. I.) U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn.

"Observations on Pelagic Mollusks Associated with the Siphonophores *Velella* and *Physalia*," by Frederick M. Bayer, Contribution No. 488, 13 pp., illus., printed in English with Spanish summary. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 13, no. 3, September 1963, pp. 454-466.) The Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

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Mussel Poisoning As a Biological Problem on the Basis of Recent Research on its Causes, by L. von Haraghy, Translation Series No. 379, 7 pp., processed, 1962. (Translated from the German, Helgolander Wissenschaftliche Meeresuntersuchungen herausgegeben von der Biologischen Anstalt Helgoland, vol. 2, no. 3, 1942; pp. 350-351.) Fisheries Research Board of Canada Biological Station, St. Andrews, B. C., Canada.

"Stimulation of Spawning in the Mussels, *Mytilus edulis* Linnaeus and *Mytilus californianus* Conrad, by Kraft Mill Effluent," by Wilbur P. Breese, Raymond E. Millemann, and Roland E. Dimick, article, The Biological Bulletin, vol. 125, no. 2, October 1963, pp. 197-205, illus., printed, single copy \$2.50. Marine Biological Laboratory, Woods Hole, Mass.

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Purse Seines and Other Roundhaul Nets in California, by W. L. Scofield, Fish Bulletin No. 81, 87 pp., illus., printed, 1951. Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

NEW ENGLAND:

"The Changing Face of the Seafood Industry," article, Frosted Food Field, vol. 36, no. 10, October 1963, pp. 22-25, 32-34, illus., printed, single copy \$1. The Olsen Publishing Co., 321 Broadway, New York, N.Y. 10007. Describes the outstanding progress achieved in the New England frozen fish industry during the past 10 years.

NEW ZEALAND:

Report on Fisheries for 1962, 24 pp., printed, 1963. Marine Department, Wellington, New Zealand. Discusses total landings by class and by year, 1945-1962; spiny lobster landings, 1953-1962; fish landings by species, 1961-1962; landings by port; foreign trade in fish and shellfish; sport fishing; fish-liver oil production; whaling, 1962 season; rock and dredged oysters; and production of toheroa (edible mollusk). Also covers whitebait fishing; angling licences; research and investigation--research vessel operations, grid pattern trawling, marine fish studies, marine mammal projects, shellfish studies, trout fisheries, Quinnet salmon, new game fish, introduction of the English mayfly for trout food, and use of insecticides; select committee to inquire into the fishing industry; Freshwater Fisheries Advisory Council; Fishing Industry Advisory Council; and legislation pertaining to fisheries. Includes statistical tables giving data on the number of fishing vessels and fishermen by port or district and method of fishing; quantity of fish and shellfish landed by port; quantity of fish landed by species and type of gear; landings by species and port; landings of fish and spiny lobsters by ports and months; and foreign trade in fishery products.

NIGERIA:

Foreign Trade Regulations of Nigeria, OBR-63-122, 12 pp., printed, September 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) Nigeria maintains an open system of imports, with controls imposed on only a few items in order to protect domestic producers, discourage smuggling, or assist indigenous traders. The report discusses Nigeria's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and label-

ing and marking requirements. Also covers special customs provisions, nontariff import trade controls, Nigeria's export controls, United States export and import controls, and diplomatic representation between Nigeria and the United States.

Report of The Federal Fisheries Service, 1961-62 and 1962-63, 26 pp., illus., printed, 1963. Printing Division, Federal Ministry of Information, Lagos, Nigeria. Discusses administrative operations, including Fisheries Service vessels, legislation affecting fisheries, and port facilities; sea research program--oceanography, inventory of resources, bionomics, and publications; Lake Chad research program--production survey and biological studies of lake fish; and brackfish-water fish culture.

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International Collaboration in Fisheries Research; a Historical Review, with Particular Reference to the North Atlantic Region. Fisheries Biology Technical Paper No. 33, 6 pp., processed, 1963. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

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Man, Land, and Food--Looking Ahead at World Food Needs, by Lester R. Brown, Foreign Agricultural Economic Report No. 11, 161 pp., illus., processed, 50 cents, November 1963. Regional Analysis Division, Economic Research Service, U. S. Department of Agriculture, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) This analysis seeks to assess the magnitude and direction of the effort which must be made during the remaining 4 decades of this century if the projected population, double today's figure, is to be sustained. The role of the United States agricultural sector, as a source of food capital and technical assistance for the food-scarce, less developed regions, is growing steadily, promising to achieve an importance without precedent.

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Corals and Sea Pens, Indicators of the Hydrological Profile and Caspian Fouling and Its Changes in the Past Ten Years (1951-61), by K. N. Nesis and G. B. Zevina, OTS 63-21646, 39 pp., printed, \$1.25, April 23, 1963. (Translated from the Russian, Okeanologiya, vol. 2, no. 4, 1962, pp. 705-726.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

"The Delusion of 'Sea Level'," by D. E. Cartwright, article, New Scientist, vol. 20, no. 359, October 3, 1963, pp. 33-36, illus., printed. Cromwell House, Fulwood Pl., High Holborn, London WC1, England. Until recently mapmakers assumed that the mean level of the sea, observed at a chosen spot, provided a foolproof basis for measuring land heights. Now scientists know that sea level is influenced by a great variety of physical effects; even across the Straits of Dover there is a discrepancy of 8 cms.

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High Stability Seaborne Platforms for Range Instrumentation, by Samuel T. Carpenter, Report No. SR 35, 52 pp., printed, December 1961. Mitre Corp., Bedford, Mass.

Natural Coloring Matter as an Indicator of Inshore Water Masses, by Thomas L. Hopkins, Contribution No. 162, printed, October 1961. Oceanographic Institute, Florida State University, Tallahassee, Fla.

Oceanographic Research, Progress Report No. 6, January 1-December 31, 1962, 20 pp., printed, 1962. Lamont Geological Observatory, Palisades, N. Y.

Oceanographic Vessels of the World, vol. II, Publication G-2 in the NODC General Series, 417 pp., illus., processed, \$4.50. National Oceanographic Data Center, Washington, D. C. This volume is essentially a continuation of the first volume of the same publication. Also includes photographs and plans of several of the unillustrated vessels in the first volume, errata to Vol. I, several ship specification revisions, and a revised ship index. Over 120 additional ships are described, including ships of 3 new countries, so that the 2 volumes now include over 300 ships belonging to 32 countries. It is planned to issue periodic supplements to keep this publication updated.

"Results of the IGY: Oceanography," by John A. Knauss, article, Science, vol. 142, no. 3590, October 18, 1963, pp. 418, 421, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington 5, D. C.

Soviet Oceanographic Research in the Mediterranean Sea, Indian and Atlantic Oceans, JPRS 12551, 27 pp., processed, February 19, 1962. (Translated from the Russian, Okeanologiya, vol. I, no. 4, pp. 745-761.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

OYSTERS:

First Supplementary List of Useful Publications for Oyster Farmers of the Maritimes, compiled by J. L. Hart, General Series Circular No. 41, 2 pp., printed, September 1963. Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B., Canada.

"Modified Clam Dredge Does Excellent Job on Oysters," by Earl R. Brenner, article, National Fisherman/Maine Coast Fisherman, vol. 44, April 1963, pp. 34-35, printed. Journal Publishing Co., Belfast, Me.

"Observations on the Food Value of Seven Species of Algae to the Larvae of *Ostrea edulis*. I--Feeding Experiments," by P. R. Waite, article, Journal of the Marine Biological Association of the United Kingdom, vol. 43, no. 3, November 1963, pp. 767-784, illus., printed, single copy \$12. Cambridge University Press, 32 E. 57th St., New York 22, N. Y.

PARASITES:

"A Myxosporidian (Sporozoon) Parasite in the Red Drum, *Sciaenops ocellatus*," by E. S. Iversen and Bernard Yokel, Contribution No. 487, 5 pp., illus., printed in English with Spanish summary. (Reprinted from Bulletin of Marine Science of the Gulf and

Caribbean, vol. 13, no. 3, September 1963, pp. 449-453.) The Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

PERU:

La Pesqueria Peruana en 1962 (The Peruvian Fishery in 1962), by Javier Iparraguirre Cortez, Serie de Divulgacion Cientifica 23, 54 pp., illus., printed in Spanish. Departamento de Economia Pesquera, Servicio de Pesqueria, Ministerio de Agricultura, Lima, Peru. Discusses the rise of Peru as a fishing nation: the position of Peru in the world fisheries; domestic consumption; processed fishery products--investment and personnel, freezing, canning, fish meal and oil, and salted fish; fishery byproducts production; and coastal production of fish and shellfish by ports and by species. Also presents data on national byproducts production and consumption of food fish, domestic and imported; fish supply in Greater Lima; quantity and value of fishery products consumed in Greater Lima, by species and source; landings of fish on the coast and its utilization; foreign trade in fishery products; world production of fish meal, fish solubles, and fish body oil; and domestic landings of whales.

PESTICIDES:

Facts for Consumers, Pesticide Residues, FDA Publication No. 18, 14 pp., illus., printed, 15 cents, October 1963. Food and Drug Administration, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) Presents a summary of how the pesticide control system operates through 2 Federal laws: The Federal Insecticide, Fungicide, and Rodenticide Act (U. S. Department of Agriculture) and the Food, Drug, and Cosmetic Act (Food and Drug Administration). Also contains sections on setting safe tolerances, policing tolerances, the farmers' role, and other safety clearance requirements.

Pesticides, Public Health Service Publication No. 1081, 8 pp., printed, 5 cents, August 1963. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) Describes briefly what pesticides are, their importance in health and food protection, and what the hazards are when they are improperly used. Also contains a brief discussion on programs the Public Health Service, together with other Federal agencies, is conducting in the study of the effects of pesticides on men, animals, plants, food, soil, air, and water; and gives a listing of safety rules to follow when using pesticides. Most pesticides available today are chemical poisons, and the pests they kill may be weeds, insects, rats and mice, algae, worms, or other destructive forms of life.

PHILIPPINES:

Foreign Trade Regulations of the Philippines, by Dawn A. Wachtel, OBR 63-138, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) The need for foreign exchange to finance increasing import require-

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ments makes vital the Philippine Government policy to expand and diversify exports and export markets. This report discusses this trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, Philippine export controls, United States foreign trade controls, and diplomatic representation between the two countries.

"Philippine Fisheries Investigations," article, Food Technology, vol. 17, June 1963, 86 pp., printed. The Garrard Press, 510 North Hickory, Champaign, Ill. Scientists are looking to the natural resources of Laguna de Bay, the largest lake in the Philippines, to help meet the protein needs of the country's rapidly growing population.

PHYSIOLOGY:

Physiological Adaptations of Fishes to New Conditions of Existence, by T. I. Privolnev, Translation Series No. 422, 10 pp., processed, 1963. (Translated from the Russian, Trudy Soveshchaniia Ikhtiologicheskoi Komissii Akademii Nauk SSSR, no. 3, 1954, pp. 40-49.)

POLLUTION:

Acid Mine Drainage, a Report Prepared for the Committee on Public Works, House of Representatives, by the Division of Water Supply and Pollution Control, Public Health Service, U. S. Department of Health, Education, and Welfare, 24 pp., illus., printed, April 19, 1962. Documents Room, House of Representatives, Washington, D. C.

The Position of the Food and Agriculture Organization with Respect to Water Pollution Control, Fisheries Biology Technical Paper No. 34, 8 pp., processed, 1963. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Water and Its Impurities, by Thomas R. Camp, 355 pp., illus., printed, \$18, 1963. Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y.

POND FISHERIES:

Fish Pond Development Planning with the Help of Linear Programming, by Gonzalo J. Arroyo, Fisheries Papers no. 21, 21 pp., printed, 1962. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

POND FISHERIES:

"Fishpond Improvement," by J. A. Bozeman and Floyd Fessler, article, The Tennessee Conservationist, vol. XXIX, no. 11, November 1963, pp. 10-11, illus., printed. Game and Fish Commission, 264 Cordell Hull Bldg., 436 Sixth Ave. N., Nashville, Tenn.

"Many Factors Figure in Building of Successful Shrimp Pond," by S. F. Manning, article, National Fisherman/Maine Coast Fisherman, vol. 44, May 1963, pp. 38-39, printed. Journal Publishing Co., Belfast, Me.

"Prawn Ponds Yield Proteins for Singapore," article, New Scientist, vol. 17, March 21, 1963, p. 619, printed. Harrison, Raison and Co. Ltd., Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

Prudovoe Rybovodstvo (Pond Pisciculture--Textbook for Teachers at Agricultural Technical Schools), by S. M. Dorokhod and others, R. 28475, printed in Russian, 1963. (Available on loan from the National Lending Library for Science and Technology, D.S.I.R., Boston Spa, Yorkshire, England.)

PREDATORS:

"Reproduction and Larval Development of the New England Clam Drill, Polinices duplicatus (Say) (Naticidae: Gastropoda)," by James E. Hanks, 1 p., printed. (Reprinted from Proceedings of the XVI International Congress of Zoology, Washington, D. C., August 20-27, 1963, vol. 1, p. 227.) Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn.

PRESERVATION:

"Fish Preservation Inquiries. III--Fisheries Products. Fish Sausages (2)," by A. R. Prater and W. A. Montgomery, article, Fisheries Newsletter, vol. 22, April 1963, pp. 25-26, printed. Commonwealth Fisheries Office, Dept. of Primary Industry, Canberra, Australia.

PROCESSING:

"Feeding for Fish Dressing (German Patent No. 900-221)," by R. T. Baader, article, Food Manufacture, vol. 38, June 1963, p. 346, printed. Leonard Hill Ltd., 9 Eden St., London NW1, England.

PROCESSING PLANTS:

Fish Working Premises - Materials and Design, by J. J. Waterman. Torry Advisory Note no. 10, 7 pp., printed, 1963. Torry Research Station, 135 Abbey Rd., Aberdeen, Scotland.

QUALITY:

Increasing the Satisfaction from Fish and Shellfish, by Charles E. Eshbach and Kirby M. Hayes, Publication 387, 19 pp., illus., printed, August 1963. Cooperative Extension Service, College of Agriculture, University of Massachusetts, Amherst, Mass. The purpose of the leaflet is to present ways to select, store, prepare, cook, and serve fish so that the most satisfaction may be obtained from use of this highly nutritious food. Discusses selection at the retail counter, forms of fish available, how much to buy, edible percentages of various fish and shellfish, and seasonality of supply and price. Also covers grades of fish, handling and storage, nutritive values, preparation and cooking, and adding contrast in color and flavor.

RADIOACTIVE ISOTOPES:

Use of Radioactive Isotopes in Fishing Industry, USSR, by G. S. Karzinkin, OTS 63-31775, 79 pp., illus., printed, \$2, September 17, 1963. Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

SALMON:

An Analysis of Gross Returns from Salmon Fishing in British Columbia by Seiners, Gillnetters, and Trollers for 1962, by B. A. Campbell and S. L. Young, 44 pp., printed, 1963. Department of Fisheries, Pacific Area, Vancouver, B. C., Canada.

"Chinook Salmon for the Selway," by Tom Welsh, article, Idaho Wildlife Review, vol. XVI, no. 3, November-

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December 1963, pp. 3-7, illus., printed. Idaho Fish and Game Commission, 518 Front St., Boise, Idaho. Presents a detailed explanation of the background and work being carried on to restore spring and summer-run Chinook salmon to the Selway River (a tributary of the Columbia River) drainage in north Idaho. In 1961, the State of Idaho began its program by means of eyed-egg plantings. Future plans call for the taking of about one million eggs annually for 8 years from fish removed from the ladders of Bonneville Dam on the Columbia River. In addition, about one million eggs will be taken annually from fish in the Salmon River drainage.

"A Feast and a Famine," article, Business Week, no. 1776, September 14, 1963, pp. 115-118, illus., printed, single copy 50 cents. McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y. Pink salmon in Alaska and Puget Sound were abundant in 1963, while the shortage of the choicer red salmon around Bristol Bay was the worst in 50 years, states the author. Washington State's Department of Fisheries ascribes the boom in pink salmon largely to severe restrictions in commercial and sports fishing in 1961, and to efforts to clear spawning streams of log jams and other manmade obstructions.

Information on the Biology of Pink Salmon Acclimatized in the Basins of the White and Barents Seas, by V. V. Azbelev, S. S. Surkov and A. A. Yakovenko, Translation Series No. 437, 4 pp., processed, 1963. (Translated from the Russian, Nauchno-tekhnicheskii Biulleten PINRO, no. 23 (20-21), 1962, pp. 37-38.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

Information on the Biology and Survival of Salmon of the Kola Peninsula, by V. V. Azbelev, Translation Series No. 440, 19 pp., processed, 1963. (Translated from the Russian, Trudy PINRO, no. 12, 1960, pp. 5-70.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

New Information on the Marine Period of Life and the Marine Fishery of Pacific Salmon, by I. B. Birman, Translation Series No. 357, 14 pp., illus., processed, 1962. (Translated from the Russian, Trudy Soveshchaniia Ikhtiologicheskoi Komissii Akademii Nauk SSSR, no. 10, 1960, pp. 151-164.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

Parasitic Diseases of Young Pacific Salmon in Fish Hatcheries of the Far East, by E. A. Bogdanova, Translation Series No. 391, 5 pp., processed, 1962. (Translated from the Russian, Nauchno-Tekhnicheskii Biulleten GosNIORKh, no. 11, 1960, pp. 49-52.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

"Potential Profits in the California Salmon Fishery," by Donald H. Frey, Jr., 12 pp., printed. (Reprinted from California Fish and Game, vol. 48, no. 4, October 1962, pp. 256-267.) Printing Division, Documents Section, Department of Fish and Game, N. Seventh St. at Richards Blvd., Sacramento 14, Calif.

"Salmon Protection in Newfoundland," by J. J. Quigley, article, Trade News, vol. 16, no. 4, October 1963,

pp. 3-4, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

Sport Fishing for Pacific Salmon, by Harry W. Howard, 153 pp., illus., printed, 1954. Koke-Chapman Company, Eugene, Oreg.

SALMON AND TROUT:

Scottish Salmon and Trout Fisheries; First Report by the Committee Appointed by the Secretary of State for Scotland, Cmnd. 2096, 58 pp., printed, 1963. Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland.

SANITATION:

"Shellfish Chief Outlines Sanitary Control System," by Eugene T. Jensen, article, National Fisherman/Maine Coast Fisherman, vol. 44, June 1963, pp. 34, 39, printed. Journal Publishing Co., Belfast, Me.

SARDINES:

Sardine Fishery for Victoria, by D. D. Lynch, Fisheries Circular No. 9, 2 pp., illus., printed. (Reprinted from Victoria's Resources, vol. 4, no. 3, September-November 1962.) Fisheries and Wildlife Department, 605 Flinders St., Melbourne C3, Australia.

SCALLOPS:

Notes on a Scallop Fishery: A Guide for Development in Victoria, by D. D. Lynch, Fisheries Contribution No. 13, 18 pp., illus., processed, October 1963. Fisheries and Wildlife Department, 605 Flinders St., Melbourne C3, Australia.

SHELLFISH:

Cooperative Program for the Certification of Interstate Shellfish Shippers. Part I--Sanitation of Shellfish Growing Areas. Part II--Sanitation of the Harvesting and Processing of Shellfish, 66 pp., printed, 1962. U. S. Public Health Service, Department of Health, Education, and Welfare, Washington, D. C., 20201.

SHRIMP:

"FAO Prawn Breeding Problem," article, Food Technology, vol. 17, May 1963, pp. 54, 56, printed. Council of Australian Food Technology Associations, Inc., 12 O'Connell St., Sydney, Australia.

"Sound Production in the Snapping Shrimps Alpheus (Crangon) and Synalpheus," by Robert E. Knowlton and James M. Moulton, article, The Biological Bulletin, vol. 125, no. 2, October 1963, pp. 311-331, illus., printed, single copy \$2.50. Marine Biological Laboratory, Woods Hole, Mass.

SMALL BUSINESS MANAGEMENT:

Advertising in International Markets, by Harry C. Thompson, Management Aid for Small Manufacturers No. 160, 4 pp., processed, January 1964. Small Business Administration, Washington, D. C., 20416. A report on the use of the valuable and final tool of advertising in overseas selling. International advertising supports overseas marketing by selling products directly to users, obtaining channels of distribution, fostering government-business relations establishing foreign credit and obtaining a good press in foreign countries. Small businessmen are urged to consult an advertising agency before initiating foreign advertising. Goals in overseas advertising

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should be carefully defined. Media choices include United States magazines with foreign circulation, international periodicals, international trade papers, local language newspapers and magazines, international television and radio broadcasting, and movies. Costs of foreign advertising are discussed and a reference list of periodicals is included in the report.

Bank Loan Limitations: Living Within Them, by Robert K. Landrum, Management Aid for Small Manufacturers No. 158, 4 pp., processed, November 1963. Small Business Administration, Washington, D. C., 20416. Loan limitations and restrictions are designed to protect the lender against unnecessary risks. Knowing the reasons for limitations can help small business owners in understanding the nature of loan limitations as set by banks and other private lenders. Describing the loan agreement, the leaflet points out that limitations and restrictions can help the owner-manager. For example, the loan agreement protects him on his rate of repayment. Also, attention is called to the importance of keeping the lender informed about changes--good or bad--in the condition of the borrowers' business.

How Small Utah Firms Get and Keep Their Employees, by Reed C. Richardson and Barbara S. Stubblefield, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington, D. C., 20416. Recruiting sources most widely used by the 1,000 firms studied were: (1) referrals, (2) the State Department of Employment Security, (3) newspaper advertising, and (4) unsolicited applications. In general, the firms relied on personal interviews and statements from former employers rather than on more formal screening devices in selecting employees. Good employer-employee relations were rated the best single approach to reducing turnover.

Tax Compliance Costs in Small Firms, by Fred J. Mueller, Management Research Summary, 4 pp., processed, 1963. Small Business Administration, Washington, D. C., 20416. Businesses in all but 4 of 38 states having sales, use, and gross-receipts taxes serve essentially as tax-collection agents for the tax authority--in the majority of cases without reimbursement for the costs incurred. About two-thirds of the 34 states levying income taxes require withholding by the employer. The report showed that compliance by the study firms with regulations covering Federal payroll taxes required an average of 9.3 hours per employee per year. Collection of sales taxes from the customer required an average of 20 seconds a transaction; recording, reporting, and remitting required a total of 8.1 hours per year.

SMELT:

"Introduction of Pond Smelt from Japan into California," by Joseph H. Wales, 2 pp., printed. (Reprinted from California Fish and Game, vol. 48, no. 2, April 1962, pp. 141-142.) Printing Division, Documents Section, Department of Fish and Game, N. Seventh St. at Richards Blvd., Sacramento 14, Calif.

SOUTH AFRICA REPUBLIC:

Department of Nature Conservation, Report No. 19, 1962, 142 pp., illus., printed. Department of Nature

Conservation, Provincial Administration of the Cape of Good Hope, Cape Town, South Africa Republic. A section on accomplishments of the Division of Inland Fisheries discusses the Jonkershoek Fish Hatchery, Pirie Trout Hatchery, and stocking of public waters. Also covers tidal waters, report on investigational work on Tilapia mossambica, and eradication of undesirable water plants.

SOUTH ATLANTIC:

"Fishing Expeditions in the Southern Atlantic," by V. Paz-Andrade, article, Fishing News International, vol. 2, January-March 1963, pp. 71-73, printed. A.J. Heighway Publications Ltd., 110 Fleet Street, London EC4, England.

SPAIN:

Establishing a Business in Spain, OBR 63-140, 12 pp., printed, 15 cents, November 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) Information of importance to Americans contemplating establishing a business in Spain is presented in this report. Since 1959 the Spanish Government has taken a number of steps toward a greater liberalization of foreign capital investments. These have included removal of restrictions on foreign ownership of Spanish companies and on the transfer abroad of earnings and the repatriation of capital. The report covers investment factors such as Spanish Government regulations on foreign investments, real estate purchases and investments, National Institute of Industry, mining legislation, treaty relations with United States, repatriation of capital and profits, and foreign trade policy. Also discusses business organization--types of organizations, the mercantile register, notaries fees and other charges, and industrial property protection; laws affecting employment--employment of aliens, syndicalism, and labor provisions; and tax system.

"Evolucion de la Industria Pesquera Espanola" (Growth of the Spanish Fishery Industry), by Agustin de Barcena y Reus, article, Boletin de Informacion, nos. 59-60, August-September 1963, pp. 3-5, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6.^a Planta, Madrid, Spain.

"La Pesca Espanola en Cifras" (The Spanish Fishery in Figures), by Alevin, article, Industria Conservera, vol. XXIX, no. 290, pp. 211-212, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

SPINY LOBSTER:

The Status of the Florida Spiny Lobster Fishery, 1962-63, by Richard K. Robinson and Dolores E. Dimitriou, Technical Series No. 42, 30 pp., illus., printed, August 1963. Florida State Board of Conservation, W.V. Knott Bldg., Tallahassee, Fla.

STERN TRAWLERS:

"Stern Trawling with the 'Netzsonde'," article, World Fishing, vol. 12, June 1963, pp. 70-71, printed. John Trundell Ltd., St. Richards House, Eversholt Street, London NW1, England. Describes use of headline echo-sounders which have a transducer fitted to the trawl.

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STORAGE LIFE:

"The Storage Life of Frozen Foods," by G. C. Walker, article, Food Preservation Quarterly, vol. 23, no. 1, March 1963, pp. 20-21, printed. Commonwealth Scientific and Industrial Research Organization, Division of Food Preservation, P. O. Box 43, Ryde, N.S.W., Australia.

SUSQUEHANNA RIVER:

"Susquehanna River Fish Pots," by John M. Hershaur, article, Pennsylvania Angler, vol. 32, no. 12, December 1963, pp. 2-6, illus., printed, single copy 25 cents. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa.

SWORDFISH:

"Swordfishing in Newfoundland," article, Trade News, vol. 16, no. 4, October 1963, p. 10, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. The Atlantic Coast's newest large-scale commercial fishery, long-line swordfishing, is having considerable success in Canada. The Newfoundland Department of Fisheries experimental and demonstration vessel Beinir landed 293 swordfish at a processing plant in Harbour Grace.

TAGGING:

"A New Method of Attaching Peterson Disk Tags with Monofilament Nylon," by John E. Randall, 5 pp., illus., printed. (Reprinted from California Fish and Game, vol. 42, no. 1, January 1956, pp. 63-67.) Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

TRANSPORTATION:

Some Problems in the Transport of Frozen Food, by D. L. Nicol, Torry Memoir No. 414, 6 p., processed, 1963. Torry Research Station, 135 Abbey Rd., Aberdeen, Scotland.

The Use of Anesthetics for the Handling and the Transport of Fishes, by William N. McFarland, 25 pp., printed. (Reprinted from California Fish and Game, vol. 46, no. 4, October 1960, pp. 407-431.) Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

TRAWLERS:

"Cathodic Protection of Trawlers Against Corrosion Damage," by M. G. Duff, article, Fishing News International, vol. 2, January-March 1963, pp. 65-67, printed. A. J. Highway Publications Ltd., 110 Fleet Street, London EC4, England.

TRAWLING:

"Construction and Operation of a Small Boat Trawling Apparatus," by Wayne J. Baldwin, 9 pp., illus., printed. (Reprinted from California Fish and Game, vol. 47, no. 1, January 1961, pp. 87-95.) Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

"New Electro-Pneumatic Towing Block," article, Canadian Fisherman, vol. 50, May 1963, pp. 31, 34, printed. National Business Publications Ltd., Gardenvale, Que., Canada.

TRAWLS:

"Les Engins de Peche--L'Ouverture Verticale du Chalut" (Fishing Gear--The Vertical Opening of the

Trawl), by A. Percier, article, France Peche, no. 77, October 1963, pp. 33-36, 38, illus., printed in French, single copy 2.5 F (about 50 U.S. cents). France Peche, Boite Postale 179, Lorient, France.

"Gallows Blocks from Norway," article, World Fishing, vol. 12, June 1963, p. 130, printed. John Trundell Ltd., St. Richards House, Eversholt Street, London NW1, England.

Trawling Gear in California, by W. L. Scofield, Fish Bulletin 72, 63 pp., illus., printed, 1948. Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

TREATIES:

Declaration of Understanding Regarding the International Convention for the Northwest Atlantic Fisheries, Washington, April 24, 1961, Treaty Series No. 71, printed, 1963, 20 cents. British Information Services, 845 3rd Ave., New York 22, N. Y.

TROPICAL FISH:

"Florida's Fabulous Fish Industry," by John W. Anderson, article, The Aquarium, vol. 32, no. 11, November 1963, pp. 3-5, illus., printed, single copy 40 cents. The Aquarium Publishing Co., Box 832, Norristown, Pa., 19404.

TROUT:

Brown Trout; its Life History, Ecology and Management, by O. M. Brynildson and others, Publication No. 234, 15 pp., printed, 1963. Wisconsin Conservation Department, Madison, Wis.

"Report Cottonseed Meal Causative Factor in Liver Cancer in Fish," article, Feedstuffs, vol. 35, June 1, 1963, p. 76, printed. Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis 5, Minn.

Some Effects of Impoundment on the Environment and Growth of Brown Trout (SALMO TRUTTA L.) in Loch Garry (Inverness-shire), by R. N. Campbell, Freshwater and Salmon Fisheries Research, No. 30, 27 pp. illus., printed, \$2.10, 1963. British Information Services, 845 3rd Ave., New York 22, N. Y.

"Trout Survival in Taylor Creek, a Tributary of Lake Tahoe, California," by Garth I. Murphy, 4 pp., printed. (Reprinted from California Fish and Game, vol. 49, no. 1, January 1963, pp. 16-19.) Printing Division, Documents Section, Department of Fish and Game, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

TUNA:

"Economic Potential of Australian Tuna," by D. J. Hardman, article, Fishing News International, vol. 2, no. 138, April-June 1963, pp. 140-141, printed. A. J. Highway Publications Ltd., 110 Fleet Street, London EC4, England.

"The 1960 Preseason Albacore Survey in the Northeastern Pacific Ocean," by William L. Craig and Robert H. Caneday, 20 pp., illus., printed. (Reprinted from California Fish and Game, vol. 48, no. 3, July 1962, pp. 179-198.) Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento, Calif.

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"La Pesca del Atun en los Mares del Globo" (The Tuna Fishery in the Seas of the World), article, *Industrias Pesqueras*, vol. XXXVII, no. 872, August 15, 1963, p. 335, printed in Spanish, single copy 40 ptas. (about 70 U. S. cents). Industrias Pesqueras, Policarpo Sanz, 21-2º, Vigo, Spain.

"The Schooling Behavior of Pacific Yellowfin and Skipjack Tuna held in a Bait Well," by James Joseph and Izadore Barrett, 1 p., printed. (Reprinted from *California Fish and Game*, vol. 49, no. 1, January 1963.) Printing Division, Documents Section No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

"Tuna Longlining: Results of a Cruise to the Eastern Tropical Pacific Ocean," by Robert C. Wilson and Bell M. Shimada, 8 pp., illus., printed. (Reprinted from *California Fish and Game*, vol. 41, no. 1, January 1955, pp. 91-98.) Printing Office, Documents Section, No. Seventh St. at Richards Blvd., Sacramento 14, Calif.

"Tuna Seining in the Atlantic," by G. J. Gillespie, article, *Trade News*, vol. 16, no. 5-6, November-December 1963, pp. 3-5, 17, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Canadian maritime fishing history was made at Wilson's Beach, Campobello Island, New Brunswick, in the late summer and early fall of 1963 when 2 vessel captains initiated the first tuna-seining operation ever undertaken in the Atlantic coastal provinces. In 5 trips to fishing grounds off the New England coast and near Block Island, the 2 vessels landed more than 700,000 pounds of tuna, mostly bluefin. The tuna were unloaded at Wilson's Beach, then trucked to a cannery at Eastport, Maine. The project was jointly sponsored and financed by the Industrial Development Service of the Canadian Department of Fisheries and the newly-formed New Brunswick Department of Fisheries. The venture so far is strictly experimental and plans call for operations over a 3-year period.

TUNA AND MACKEREL:

"The Names of Tunas and Mackerels," by Phil M. Roedel, 1 p., printed. (Reprinted from *California Fish and Game*, vol. 49, no. 2, April 1963.) Printing Division, Documents Section, No. Seventh St. at Richards Blvd, Sacramento 14, Calif.

TURKEY:

Balik ve Balıkçılık (Fish and Fishery), vol. XI, no. 11, November 1963, 35 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G. M., Balıkçılık Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, articles on: "Some Chemical Aspects about the Bonito and Horse Mackerel which Are Caught in Our Waters;" and "Basic Researches in Inland Waters."

Investment Factors in Turkey, by Barbara H. Hise, OBR 63-137, 12 pp., printed, 15 cents, November 1963. Bureau of International Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) Factors to be considered by potential United States investors in Turkey. Covers scope of private foreign investment, fields for private foreign investment and enterprise, Government policy toward foreign investment, Government con-

trols over industry, and screening of investment proposals. Also includes information on taxation, financing facilities, labor conditions, investment counseling, foreign investment encouragement law, and handling of foreign capital brought into Turkey.

UNDERWATER EXPLOSIONS:

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BAKED HALIBUT TOPPED WITH FRENCH FRIED ONION RINGS
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Created in the Test Kitchens of the U. S. Department of the Interior's Bureau of Commercial Fisheries, this sparkling seafood recipe calls on halibut to provide easy economy and easy elegance for today's imaginative homemaker.

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BAKED HALIBUT SURPRISE

| | |
|---|--|
| 2 pounds halibut steaks or other fish steaks, fresh or frozen | $\frac{1}{4}$ teaspoon salt |
| | 1 can ($3\frac{1}{2}$ ounces) french fried onions |
| $\frac{1}{2}$ cup French dressing | |
| 2 tablespoons lemon juice | $\frac{1}{4}$ cup grated Parmesan cheese |



Baked halibut surprise.

Thaw frozen steaks. Cut into serving-size portions. Place fish in a shallow baking dish. Combine dressing, lemon juice, and salt. Pour sauce over fish and let stand for 30 minutes, turning once. Remove fish from sauce and place in a well-greased baking dish, 12 x 8 x 2 inches. Crush onions. Add cheese and mix thoroughly. Sprinkle onion mixture over fish. Bake in a moderate oven, 350° F., for 25 to 30 minutes or until fish flakes easily when tested with a fork. Serves 6.

From Special Fisheries Marketing Bulletin:
"Heirloom Seafood Recipes to Treasure."

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COMMERCIAL FISHERIES REVIEW



VOL. 26, NO. 5

MAY 1964

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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
G. A. Albano and H. Beasley, Assistant Editors

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Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

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COMMERCIAL FISHERIES REVIEW

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SECOND WORLD FISHING GEAR CONGRESS

By Edward A. Schaefers* and Dayton L. Alverson**

On May 25, 1963, the Second World Fishing Gear Congress, arranged by the Food and Agriculture Organization of the United Nations, convened in London, England. Six years had elapsed since the First World Fishing Gear Congress, also arranged by FAO, convened in Hamburg, Germany. Some 600 delegates from 50 countries registered for the Second Congress at which 87 technical papers were presented and discussed during the five days of technical sessions (May 27-31).

To facilitate presentation and discussion, papers were divided, by natural classifications, into three main subjects: Materials, Gear and Fishing, and Gear Research. Each of these majors subjects included a wide variety of topics. Rapporteurs from various countries were chosen to summarize one or more topics under each major subject.

MATERIALS

The discussion on materials centered around a review of the most widely used synthetic fibers which play such an important role in today's fisheries. Three topics, knotless netting, the use of monofilament nets, and new net materials, received the greatest emphasis. In contrast to the 1957 Gear Congress, when a host of new synthetic fibers were being incorporated into fisheries, only one new synthetic fiber, polypropylene, was discussed in detail at the 1963 Congress. Experiments with this material have resulted in favorable catches during fishing trips in Japan, England, Germany, and the United States. These results suggest increased use of this fiber in fisheries. The introduction into fisheries of only one new synthetic net material in the past several years is not surprising considering the wide group of synthetic fibers which were introduced and adopted prior to 1960. When those materials were first tried by various fisheries their efficiency was judged by comparing their physical and chemical properties with those of natural fibers. Synthetics having desirable characters were soon adopted into world fisheries. Accordingly, new net materials must now compete with high-quality, well-proven synthetic twines, and must have characteristics which make them more suitable for use in fisheries than existing synthetic twines.

The most striking change in the discussion on synthetic fiber materials between the 1957 and 1963 Gear Congresses was the complete acceptance at the latter Congress of synthetic fibers as the dominant material used for net construction. During the 1957 Congress synthetic fibers for fishing nets were relatively new. Considerable debate occurred as to the desirability of synthetic materials for use in various fisheries and as to the comparative merits of natural and synthetic fibers.

In Japan, where synthetics were introduced into the fishing industry in 1949, the use of those fibers for fabrication into fishing nets has increased at a tremendous rate and by 1959 a total of 21.2 million pounds were reported as having been used. Two years later, in 1961, use of synthetics for nets had risen to 30.7 million pounds (table). Correspondingly, there has been a decrease in the use of natural fibers for netting in Japan--from 28 million pounds

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| Japanese Production of Synthetic Fibers for Fishing Nets, 1955, 1957, 1959, and 1961 | | | | |
|--|--------------------------|--------|--------|--------|
| Product | 1961 | 1959 | 1957 | 1955 |
| | (1,000 Lbs.) | | | |
| <u>Synthetic Fibers:</u> | | | | |
| Nylon | 12,749 | 8,314 | 6,123 | 3,535 |
| Vynlon | 12,679 | 8,923 | 7,410 | 3,890 |
| Polyvinylidene chloride | 1,393 | 1,467 | 1,388 | 1,148 |
| Polyvinyl chloride | 574 | 1,056 | 931 | - |
| Polyester | 238 | - | - | - |
| Polyethylene | 1,716 | - | - | - |
| Twisted blended yarn of filament | 1,333 | 1,452 | 1,089 | 42 |
| Total synthetic fibers | 30,682 | 21,212 | 16,941 | 8,615 |
| Natural Fibers: | 4,413 | 10,668 | 13,869 | 24,781 |

Source: "Synthetic Fibre Fishing Nets and Ropes Made in Japan," by Japan Chemical Fibres Association, Tokyo, Japan (see Appendix).

in 1949 to only 4.4 million pounds in 1961. With regard to Japanese synthetic fiber fishing nets for export, the total soared from 383,000 pounds in 1955 to 10.6 million pounds in 1961, and found markets in more than 100 nations. The delegates were quite surprised to learn that while conversion to synthetics was 85 percent for netting, about 90 percent of the ropes used are still of natural fibers. Although the trend in Japan is perhaps somewhat more dramatic than that which has occurred in other fishing nations, the use of synthetics as compared to natural fibers for nets has followed the same general trend throughout the world.

Knotted netting is still the main material used in net construction by the fishing industry throughout the world. Knotless netting, however, is becoming increasingly important. Knotless netting is currently produced in two types; the Japanese twisted type and the Raschel knitted type. In Norway, West Germany, Belgium, Peru, and the United States, the major increase in use of knotless netting has been in the Raschel type. The manufacture of this type is based on the Raschel-technique, well known in curtain material manufacture for at least 100 years. The use of Raschel-type netting in Norwegian fisheries increased from 17 tons in 1960 to approximately 200 tons in 1962.

No detailed discussion occurred concerning the differences in catchability between knotless and knotted webbing. The major advantage of knotless webbing was reported to be its lower cost. For example, in Norway purse seines made from small-mesh knotless netting were reported to be from 25 to 30 percent cheaper than those made from knotted netting. With increasing mesh size, however, a point is reached when knotted netting can currently be produced more economically. It was also brought out that in Peru, 75 of the 1,200 purse seines now in operation are made of knotless netting, and that a new factory was recently established there which should produce 400 tons of Raschel knotless netting each year.

Monofilament netting was also predicted to play an increasingly important role in world fisheries, particularly in gill-net fishing for species currently underutilized. In Viet Nam, monofilament netting is already the most popular material used for gill nets, outnumbering multifilament gill nets 8,000 to 160.

It was emphasized throughout the discussions on synthetic materials that it is most important not to generalize concerning the effectiveness of specific types of synthetics, particularly when the generalizations were derived from experiments in only one fishery and in one geographic area. Success of synthetics in one area or fishery does not insure its success in similar fisheries in other areas.

GEAR AND FISHING

Topics under the subject Gear and Fishing ranged from stern trawling to fish detection. A considerable portion of the time available for discussing fishing gear and fishing methods was devoted to stern, midwater, and bottom trawling. The predilection for trawling obviously

resulted from the large number of participants at the meeting from nations where trawling represents a major harvesting technique. For example, in Great Britain more than 70 per cent of the fish landed are taken with trawls.

A considerable portion of the time spent in discussing stern trawling was devoted to smaller vessels ranging in length from 70 to 100 feet. Particular attention was drawn to the 83-foot United States combination stern trawler-purse seiner Narragansett and to the 99-foot English stern trawler Ross Daring. The high degree of automation and extensive use of centralized controls by both those vessels allows considerable reduction in manpower while improving handling procedures. The Narragansett, for example, is designed to operate with only three fishermen, while the Ross Daring is capable of operating with five.

Although some disagreement occurred concerning the desirability of increased mechanization and centralized controls aboard fishing vessels, the opponents of mechanization failed to convince the majority. But it was obvious that the mechanization trend will continue (fig. 1). In fact, it was the opinion of many of the delegates that the main key to the survival of the fishing industry as a business proposition is a continual increase in automation and mechanization aboard fishing craft. Such increases in automation must lead to greater productivity for fishermen.

The advancements indicated in bottom trawling since the 1957 Fishing Gear Congress were disappointing and only one real breakthrough occurred which appears to offer any real possibilities of improving efficiency or effectiveness of this method of fishing. This concerns developments in the use or application of electricity to bottom trawls for capturing bottomfish and shrimp. Experiments with electrical trawls were regarded as offering significant possibilities of improving their catching ability. The use of electricity to bring about galvanonarcosis of fish in front of the trawls was reported to increase the catching efficiency, depending on species, from about 100 to 500 per cent.

A paper describing possibilities of improving the capture of shrimp which burrow during daylight hours by applying an electrical shocking system to the trawl, was one of the more impressive contributions involving trawling. The results of the electrical shocking caused shrimp to rise from their burrows to where they were susceptible to being captured by the trawl.

Although considerable attention was given to midwater trawling, advancements in that method of fishing since 1957 had not occurred at a pace which investigators had desired. Delegates, who anticipated hearing of Japanese midwater trawling experiments in the eastern China Sea, were disappointed as that paper was not assembled in final form before the meeting adjourned. It was reported, however, that midwater trawls had been used to capture shrimp in the eastern China Sea with considerable success. It was stated that some 200 Japanese vessels are now engaged in midwater trawling for shrimp in that area. Midwater trawling is carried out as a single boat operation with vessels of approximately 370 tons using a trawl with a 160-foot headline; pair trawling is conducted from two smaller bull trawlers working side-by-side using a net with a 200-foot headline. The success of the Japanese midwater shrimp trawling appears to be keyed to accurate vertical control of the net which is achieved through use of an acoustical device which records in the wheelhouse the depth that

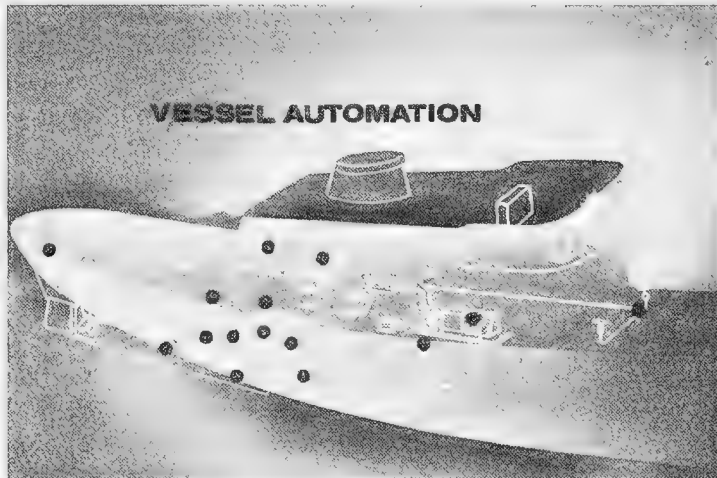


Fig. 1 - Vessel automation--circles indicate operations that can be automated or remotely controlled aboard fishing vessels.

the net is fishing. Considerable discussion occurred on the effectiveness of one-boat versus two-boat midwater trawling. It would appear that in spite of several successful one-boat operations that, in general, two-boat midwater trawling had been more productive from a commercial standpoint.

A notable change was apparent in the concept of the use of midwater trawls. Some of the more vigorous proponents of midwater trawling, who previously viewed that gear as a panacea for the problems confronting bottom trawling, now look on midwater trawls as tools to be used interchangeably with bottom gear. Thus, when conditions appear appropriate for use of midwater trawls, that is, when fish appear to be congregated in dense schools above the bottom, this type of gear would be used. In other circumstances, however, conventional bottom gear would be employed.

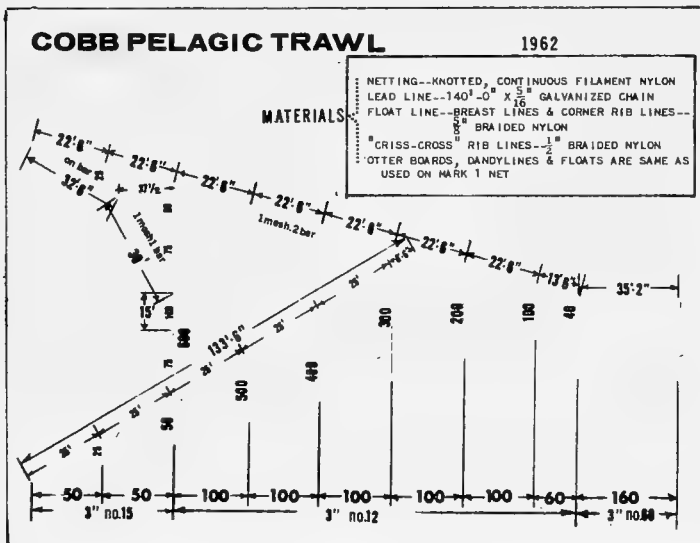


Fig. 2 - Extremely large midwater trawl being developed in the United States and designed to be towed at slow speeds. Most previous efforts have been towards development of small midwater trawls to be towed at high speeds.

An extremely large midwater trawl developed in the United States was discussed in some detail (fig. 2). This trawl was designed primarily to evaluate whether or not relatively fast-swimming pelagic species could be captured in midwater trawls. The gear achieved some success in that bonita, barracuda, mackerels, and other relatively rapid-swimming species were taken. The gear is at present, however, considered successful only as a biological sampling tool although alterations and continued experiments with the gear are designed toward developing a successful commercial net.

It was apparent that most people were impressed with the rather significant improvements in fish-detecting devices in recent years, particularly for distinguishing schooling species just off the bottom and for horizontal echo-ranging. The efficient use of modern echo-

sounding equipment for fish detection and fishing tactics has become an important part of many fisheries. Although there have been considerable improvements in the sensitivity and resolution of acoustical devices, the improvements have been paralleled by increased difficulty in interpretation and operation, these requiring specialized training and greater skill in the fishermen who use them. In the Norwegian fisheries the need for training in sonar operation has become an urgent matter, and several years ago instruction courses were organized. Those courses, which originally required eight days of training, are expected to be lengthened. The present course given in Norway has the objective of training operators in proper use of the equipment and to classify and identify echo traces.

In addition to fish detection through echo-sounding, airplane spotting was discussed at considerable length, although not a single paper was prepared on the subject. This technique is used rather widely on both coasts of North America, and on the west coast of South America. In Chilean fisheries some operators reported that one spotter plane could successfully be employed to assist ten catcher vessels.

Fleet operations involving motherships, although certainly not new, were the subject of considerable debate. Such operations are now carried out in practically all major oceans. Although fleet operations of that type date back some 300 years, there has been a rapid expansion and buildup of fleet operations throughout the world in recent years. Such operations are now directed toward capture of a great variety of species including bottomfish, king crab, tuna, and sardine-like fishes. Although a distinct trend has occurred among European nations

toward operation of independent freezer trawlers and factory trawlers, this method has not proved successful in all instances. It was felt that where it is necessary to carry out fishing operations at considerable distances from home ports (greater than 4,000 miles), mothership operations are more successful.

There was little if any evidence of a major breakthrough in changes or mechanization in the handling of long-line gear. An interesting paper on the mechanization of dropline fishing at depths of 500 fathoms in the South Pacific, however, received favorable comment (fig. 3). An excellent example of mechanization of a fishery, however, was provided in a paper describing Alaskan king crab operations. This fishery produced approximately 50 million pounds of king crab from a fleet of about 200 vessels in 1962. The success of the fishery can be attributed to the efficiency of the modern king crab pot and to methods used in handling and hauling pots with gypsy winches or V-grooved hydraulic pot haulers. Alaska king crab pots measuring 7 feet x 7 feet x 2½ feet and weighing approximately 200 pounds each are commonly used. Some of the pots have caught over 200 crabs thus giving the pot and its contents a total weight of approximately 2,200 pounds. On an average, however, 50 crabs per pot is considered good fishing.

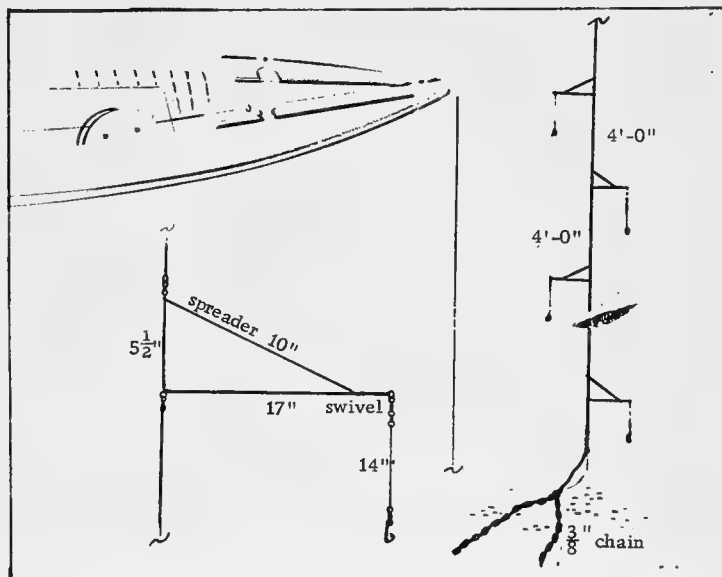


Fig. 3 - Mechanized dropline gear--steel wire leads over bow of vessel to gurdy drum powered by small gasoline engine.

Although only one document was presented at the conference describing purse-seining techniques, considerable discussion was initiated from the floor concerning purse-seine activities, with particular attention devoted to the South American anchovetta fishery and the United States tuna operation. It was noted that in the case of the United States tuna fishery an almost complete conversion from the previous pole-and-line method occurred. In other fisheries minor modifications and adjustments in purse-seine techniques have resulted in more effective operations. In general, the increased efficiency in seining operations has been attributed to the adoption of power-hauling techniques (generally the power block), synthetic twines, and more effective methods of fish detection. In purse-seining operations, fish detection includes the use of aircraft and horizontal-scanning techniques. Delegates pointed out the necessity of adapting purse-seine operations to local conditions and to varying fishing tactics depending on species being sought.

GEAR RESEARCH

The final topics of the gear congress were under the subject of Gear Research. Topics discussed included instrumentation, fish behavior, application of telemetry and computers to fisheries problems, and finally, a look into the future of fishing.

The session considering instrumentation and dynamics of fishing gear was involved with methods of measuring the various forces acting upon towed fishing gear, primarily trawls. Various studies conducted in Japan, Norway, and England on the resistance of netting, trawl doors, warps, and other components of the gear related numerous facts (some conflicting) concerning the most effective design for trawls. Some of the varying opinions concerning efficient trawl design presumably result from differential behavior patterns of species sought. The progress in instrumentation, however, appears to be on the verge of contributing several devices which may be used by commercial fishermen in the near future. Possible devices in-

clude on-bottom indicators, cod-end load indicators to determine the quantity of fish captured, and automatic positioning and control devices for midwater trawls.

Improvement in the array of fishing devices currently available to fishermen in the future is perhaps largely dependent on the accrual and advancement of the knowledge of fish behavior. There can be little doubt that considerable emphasis was placed during the Congress on fish behavior and the importance of determining diurnal, seasonal, and geographic behavior patterns of species, as well as behavior to fishing gear and physical or chemical stimuli. It was quite evident from discussions that gear technologists, biologists, net manufacturers, and fishermen must be cognizant that successful design of fishing gear will require more data on the behavioral characteristics of various species sought. This field has been neglected to some extent by gear technologists as greater emphasis was placed on physical engineering properties of gear and the behavior of the gear itself. To be effective, however, the engineering and physical characteristics of gears must be considered along with behavioral aspects of fishes.

Preliminary experiments involving the reaction of commercial species of fishes such as herring, cod, whiting, and haddock, indicate that of the various stimuli produced by stationary and moving gears, visual responses are the most important and therefore determine to a large degree the effectiveness of fish-capturing devices. For example, in daylight it was observed that fish in the vicinity of the seabed respond to towed trawls by swimming away from the gear along its path and there was no evidence of avoiding the gear by swimming upwards. In midwater gear, however, avoidance was sometimes effected by sounding or moving downward in the water column. In darkness, those responses did not appear to take place, and the orientation and movement away from the gear were much less pronounced.

The various papers presented and the resulting discussions indicated that considerable knowledge is being compiled and assembled from fishermen and scientific investigators on the general behavior patterns of marine commercial species. There are, however, many unknowns concerning detailed behavior responses of fish to natural environmental and artificial influences. It is obvious that greater emphasis is now being placed by marine scientists on conducting experiments on the behavioral aspects of fish in their natural environment, rather than in tanks ashore, which has been the case in the past.

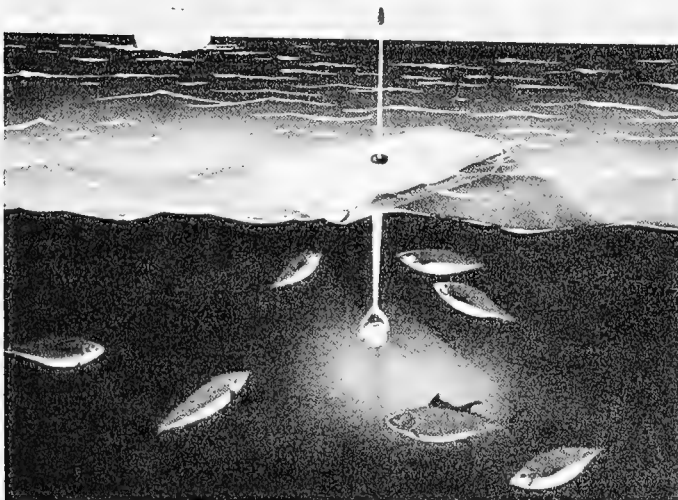


Fig. 4 - "Artificial log" would be designed to attract and detect schools of pelagic fish and relay to a catcher vessel information on concentrations of fish in vicinity of the "log."

Future harvesting methods and the possible applications of high-speed computers and associated elements of automatic data processing to the fishing industry were the final topics of the Congress. It was reported that at least one United States fishing company is currently using computer techniques and that high-speed digital computers have been utilized by some shipbuilders to resolve form lines.

Future concepts of fishing were discussed with emphasis being placed on the need to adapt engineering principles employed in industry, military, and space fields. Improvements in the next several decades visualized possible systems that might be employed to increase harvest of living resources of the seas. Those discussed included retrievable buoys with built-in detection systems which could automatically signal a catcher vessel of the presence of fish. Artificial logs were

suggested for attracting fish. Those would also have built-in detection systems for automatically signaling a catcher vessel when commercial concentrations of fish were present (fig. 4). A network of oceanographic buoys was envisaged which would detect and transmit their data through satellite telemetry to a shore site "hydro-central." The data would be collated, analyzed, and transmitted back via facsimile methods to fishing vessels and to various fishing centers throughout the world. Also discussed was the possibility of application to fishing vessels and fishing gear of lightweight materials developed for space vehicles.

CONCLUSIONS

In reviewing the various papers presented and considering the discussions which were initiated from the floor by the delegates, it was obvious that some basic changes had occurred in concepts of fishing since the first Congress was held in Hamburg in 1957. At the 1957 Congress stern trawlers were just entering fisheries and they were the subject of considerable debate. Their success was doubted in many instances and many looked upon them as exotic experimentation. At the 1963 Congress, however, they were an accepted and important constituent of the modern trawling fleets and there could be little doubt of their continued and expanded use. Synthetics, which were also a somewhat new commodity in fisheries at the 1957 Congress, have since been universally accepted.

The 1963 Congress perhaps did not provide any major breakthroughs of proven commercial feasibility in new systems of harvesting fish and other living resources, but there was strong evidence of the realization for the necessity of applying modern engineering concepts to fisheries, to automation of fishing vessels, and the need to strike out boldly into new frontiers with radically new fish-capturing devices. To help resolve those problems, greater emphasis is being directed toward understanding fish and their reaction to natural and artificial stimuli. It would seem that by the time of the next fishing gear congress, research in those fields will have been instrumental in developing entirely new tactics for application to fisheries throughout the world.

The "Appendix - List of Papers Presented at the Second World Fishing Gear Congress," appears on pages 8-11.

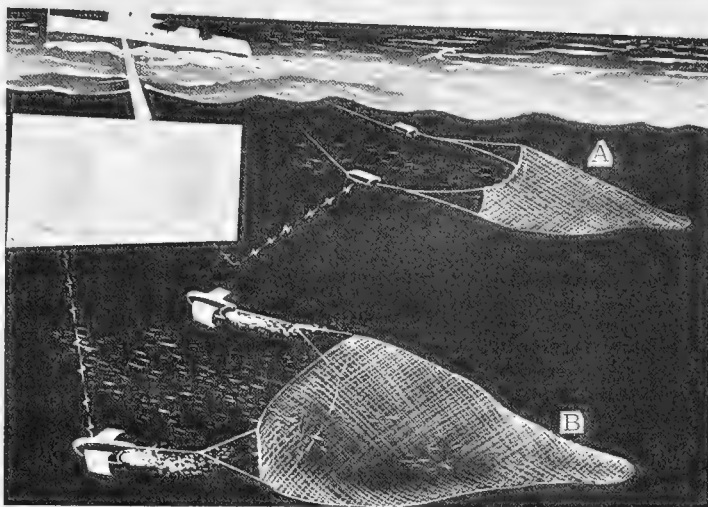


Fig. 5 - Possible futuristic midwater trawling:
 A--Midwater trawl with powered spreading devices controlled from bridge through electrical conductors.
 B--Midwater trawling with self-contained power units remotely controlled from vessel.

APPENDIX - LIST OF PAPERS PRESENTED AT THE SECOND
WORLD FISHING GEAR CONGRESS

Subject: MATERIALS

Topic: Netting Twines - Standardization of Terminology and Numbering Systems

STANDARDIZATION OF TERMINOLOGY AND NUMBERING SYSTEMS FOR NETTING TWINES, by Gerhard Klust, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

Topic: Standardization of Testing Methods

TEST METHODS FOR FISHING GEAR MATERIALS (TWINES AND NETTING), Edited by A. von Brandt, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany. Revised by P.J.G. Carrothers, Fisheries Research Board of Canada, St. Andrews, New Brunswick, Canada.

Topic: New Net Materials

POLYPROPYLENE TWINES IN JAPAN, by Katsuji Honda, Professor Tokyo University of Fisheries, Tokyo, Japan, and Shigeru Osada, The Nippon Gyomo Sengu Kaisha Ltd., Tokyo, Japan.

SYNTHETIC FIBRE FISHING NETS AND ROPES MADE IN JAPAN, by Japan Chemical Fibres Association, Tokyo, Japan.

THE USE OF "ULSTRON" POLYPROPYLENE IN THE FISHING INDUSTRY, by C.L.B. Carter and K. West, Fibres Division, Imperial Chemical Industries Ltd., Harrogate, Yorkshire, England.

PRODUCTION AND CHARACTERISTICS OF SYNTHETIC NETS AND ROPES IN JAPAN, by Yoshinori Shimozaki, Tokai Regional Fisheries, Research Laboratory, Tokyo, Japan.

ETUDES SUR LE FREINAGE ET L'USURE DES FILS DE PECHE, by Maurice Bombeke, Etablissements Cousin Frères, Wervicq-sud, France.

NETTING TWINES MADE OF POLYPROPYLENE AND POLYAMIDE, A COMPARISON OF THEIR PROPERTIES, by Gerhard Klust, Institut für Netz- und Materialforschung, Hamburg-Altona 1, Federal Republic of Germany.

NEW SYNTHETIC MATERIALS FOR HERRING DRIFTNETS USED IN THE NORTH SEA, by Janusz Zaucha, Sea Fisheries Institute, Gdynia, Poland.

Topic: Lines and Ropes

ROPES OF POLYETHYLENE MONOFILAMENTS, by C. C. Kloppenburg, Kunstzijdespinnerij "Nyma" N.V., Nijmegen, Netherlands, and J. Reuter, Nederlandsche Visserij-Proefstation en Laboratorium voor Materialen-Onderzoek, Utrecht, Netherlands.

Topic: Knotless Nets

KNOTLESS NETTING IN THE NORWEGIAN FISHERIES, by Norvald Mugaas, Statens Fiskeredskapsimport, Bergen, Norway.

TESTS ON KNOTLESS RASCHEL NETTING, by A. von Brandt, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

KNOTLESS FISHING NETS PRODUCED ON RASCHEL EQUIPMENT IN ITALY, by Mario Damiani, Societa Rhodiatoce S.p.A., Milan, Italy.

RESISTANCE A LA RUPTURE DE FILETS SANS NOEUDS, by Francesco Pianaroli, Retificio Carlo Badinotti, Milan, Italy.

Topic: Monofilament Nets

MONOFILAMENTS IN FISHING, by W. Henstead, British Celanese Ltd., Coventry, England, and D.F.C. Ede, British Resin Products Ltd., Piccadilly, London, England.

THE USE OF NYLON MONOFILAMENT IN THE VIET-NAM FISHERIES, by Tran-Van-Tri and Ha-Khac-Chu, Fisheries Directorate, Saigon, Viet-Nam.

MONOFILAMENT GILLNETS IN FRESHWATER FISHING--EXPERIMENTAL AND PRACTICAL RESULTS, by R. Steinberg, Institut für Netz- und Materialforschung, Hamburg-Altona 1, Federal Republic of Germany.

Subject: GEAR AND FISHING

Topic: Stern Trawling

THE STERN TRAWLER - A DECADE'S DEVELOPMENT IN TRAWL HANDLING, by Conrad Birkhoff, Fischereitechnische Konstruktionen, Hamburg 13, Federal Republic of Germany.

SOME SMALL STERN TRAWLERS, by E.C.B. Corlett, Burness, Corlett & Partners Ltd., Basingstoke, England.

ROSS DARING - EXPERIMENT, by Dennis Roberts, Ross Trawlers Ltd., Grimsby, England.

Topic: Bottom Trawling with High Opening Nets or Low and Wide Opening Nets

DEVELOPMENT OF AN IMPROVED OTTER TRAWL GEAR, by Chikamasa Hamuro, Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

SUGGESTIONS FOR IMPROVED HEAVY TRAWL GEAR, by Eldon Nichols, American Telephone and Telegraph Company, 32 Avenue of the Americas, New York, New York, U.S.A.

FLEET TRAWLING OPERATIONS, by Hiroshi Tominaga, 4, 1-Chome, Marunouchi, Chiyoda-Ku, Tokyo, Japan.

THE DEVELOPMENT OF ELECTRICAL SHRIMP TRAWLING GEAR, by Fredrick Wathne, U. S. Bureau of Commercial Fisheries, Gear Research Station, Panama City, Florida, U.S.A.

JAPANESE FISH NETTING OF SYNTHETIC FIBRES, by Iwao Tani, Japan Synthetic Fibre Net and Rope Association, Echizenbori, Chuo-ku, Tokyo, Japan.

TOWING POWER, TOWING SPEED AND SIZE OF BULL TRAWL, by Chikamasa Hamuro, Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

DOUBLE-RIG SHRIMP BEAM TRAWLING, by J. Verhoest, Commissie T.W.O.Z., and A. Maton, Rijkstation voor Boerderijbouwkunde; both of the University of Agriculture, Ostend, Belgium.

SOME COMPARATIVE FISHING EXPERIMENTS IN TRAWL DESIGN, by W. Dickson, Department of Agriculture and Fisheries for Scotland, Marine Laboratory, Torry, Aberdeen, Scotland.

SOME OF THE GENERAL ENGINEERING PRINCIPLES OF TRAWL GEAR DESIGN, by P. R. Crew, Westland Aircraft Ltd., Saunders-Roe Division, East Cowes, Isle of Wight, England.

DEVELOPMENT OF SOVIET TRAWLING TECHNIQUES, by A. I. Treschev, Institute of Marine Fisheries and Oceanography (VNIRO), Moscow, U.S.S.R.

Topic: Midwater Trawling

DEVELOPMENT OF THE COBB PELAGIC TRAWL-- A PROGRESS REPORT, by Richard L. McNeely, Exploratory Fishing and Gear Research Base, Bureau of Commercial Fisheries, Seattle, Washington, U.S.A.

REACTION OF HERRING TO FISHING GEAR STUDIED BY MEANS OF ECHO SOUNDING, by H. Mohr, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

UNDERWATER TELEMETERS FOR MIDWATER TRAWLS AND PURSE SEINES, by Chikamasa Hamuro and Kenji Ishii, Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

TWO-BOAT MIDWATER TRAWLING FOR HERRING WITH BIGGER BOATS, by Rolf Steinberg, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

UNIVERSAL ONE-BOAT MIDWATER AND BOTTOM TRAWL, by S. Okonski, Sea Fisheries Institute, Gdynia, Poland.

ONE-BOAT MIDWATER TRAWLING IN GERMANY, by J. Scharfe, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

SOME NOTES ON THE IMPORTANCE OF BIOLOGICAL FACTORS IN FISHING OPERATIONS, by B. B. Parrish and J.H.S. Blaxter, Marine Laboratory, Aberdeen, Scotland.

Topic: Gill-netting

JAPANESE SALMON MOTHERSHIP FISHERY, by Masatake Neo, Nichiro Gyogyo Kaisha Ltd., Marunouchi Bldg., Tokyo, Japan.

DRIFTNET HAULERS FOR SALMON FISHING, by Chihiro Miyazaki, Tokai Regional Fisheries Research Laboratory, Tokyo, Japan.

MECHANIZATION OF DRIFTNET FISHING OPERATIONS, by P. A. Kuraptsev, Institute of Marine Fisheries and Oceanography (VNIRO), Moscow, U.S.S.R.

Topic: Long-lining

ECHO-SOUNDER MEASUREMENT OF TUNA LONG-LINE DEPTH, by Kyotaro Kawaguchi, Kanagawa Pre-

fectural Fisheries Experimental Station, Misaki, Miura City, Japan; Masakatsu Hirana, Sanken Electronics Co., Numazu City, Japan; and Minoru Nishimura, Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

MOTHERSHIP BOTTOM LONGLINE FISHERY, by Hiroshi Tominaga, Taiyo Gyogyo Kabushiki Kaisha, 4, 1-Chome, Marunouchi, Chiyoda-Ku, Tokyo, Japan.

DROPLINE FISHING IN DEEP WATER, by Ronald Powell, Government of the Cook Islands, Rarotonga, Cook Islands.

Topic: Traps, Pots, and Dredges

EEL TRAPS MADE OF PLASTIC, by H. Mohr, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

TYPES OF PHILIPPINE FISH CORRALS (TRAPS), by Arsenio N. Roldan, Jr., and Santos B. Rasalan, Philippine Fisheries Commission, Diliman, Quezon City, Philippines.

A NEW FISH TRAP USED IN PHILIPPINE WATERS, by Santos B. Rasalan, Philippine Fisheries Commission, Diliman, Quezon City, Philippines.

LES MADRAGUES ATLANTIQUE ET SICILIENNE, by Vito Fodera, FAO/EPTA Fishery Adviser, Tunis, Tunisia.

KING CRAB POT FISHING IN ALASKA, by Robert F. Allen, Marine Construction and Design Company, Seattle, Washington, U.S.A.

Topic: Purse Seining

SONAR INSTRUCTION COURSES FOR FISHERMEN, by G. Vestnes, Fiskeridirektoratets Havforskningsinstitutt, Bergen, Norway.

RECENT DEVELOPMENTS IN ICELANDIC HERRING PURSE SEINING, by Jakob Jakobssen, Atvinnudeild Háskólans Fiskideild, Reykjavik, Iceland.

Topic: Deck Machinery

SOME SMALL STERN TRAWLERS, by E.C.B. Corlett, Burness, Corlett & Partners Ltd., Basingstoke, England.

THE APPLICATION OF HYDRAULIC POWER TO FISHING GEAR, by D. W. Lerch, Marine Construction and Design Company, Seattle, Washington, U.S.A.

THE COMPLEX MECHANIZATION OF BEACH SEINING, by S. S. Torban, Institute of Marine Fisheries and Oceanography (VNIRO), Moscow, U.S.S.R.

Topic: Controls

ADVANCES IN CENTRALIZED CONTROL AND AUTOMATION, by H. E. H. Pain, Marine & Navigation Division, S. G. Brown Ltd., Watford, England.

Topic: Fish Detection

DETECTEUR DEPOISSON "EXPLORATOR," by J. Fontaine, Compagnie générale de télégraphie Sans Fil (CSF), Paris, France.

A COMPREHENSIVE ECHO SOUNDER FOR DISTANT-WATER TRAWLERS, by G. H. Ellis, P. R. Hopkin and R. W. G. Haslett, Kelvin Hughes Division of S. Smith & Sons (England) Ltd., London, England.

ECHO-SOUNDING THROUGH ICE, by Tomiju Hashimoto, and Yoshinobu Maniwa, both of Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan; and Osamu Omoto, and Hidekuni Noda, both of Shibaura Technical Institute, Tokyo, Japan.

FREQUENCY ANALYSIS OF MARINE SOUNDS, by Tomiju Hashimoto and Yoshinobu Maniwa, Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

ECHODETECTION OF TUNA, by Minoru Nishimura, Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

SECTOR-SCANNING SONAR FOR FISHERIES PURPOSES, by D. G. Tucker and V. G. Welsby, both of The University of Birmingham, Birmingham, England.

IDENTIFYING PACIFIC COAST FISHES FROM ECHO-SOUNDER RECORDINGS, by E. A. Best, Marine Resources Branch, California Department of Fish and Game, Menlo Park, California, U.S.A.

DETECTION ET LOCALISATION DES BANCS DE POISSONS, by Robert Lenier, President du Syndicat de matériel professionnel des Industries Electroniques et Radio-Electriques, Conseiller des Pêches Maritimes, Courbevoie (Seine), France.

A NEW SONAR SYSTEM FOR MARINE RESEARCH PURPOSES, by T. S. Gerhardsen, Simonsen & Mustad A.A., Horten, Norway.

STUDY OF ACOUSTICAL CHARACTERISTICS OF FISH, by E. V. Shishkova, Institute of Marine Fisheries and Oceanography (VNIRO), Moscow, U.S.S.R.

BIO-ACOUSTICAL DETECTION OF FISH-POSSIBILITIES AND FUTURE ASPECTS, by G. Freytag, Institut für Netz- und Materialforschung, Hamburg-Altona 1, Federal Republic of Germany.

Topic: Fleet Operations

MOTHERSHIP FISHING FOR CRAB, by Nippon Suisan Kaisha, Ltd., Tokyo Building, Marunouchi, Chiyodaku, Tokyo, Japan.

TUNA LONGLINE MOTHERSHIP FLEET OPERATIONS, by Goro Okabe, Taiyo Gyogyo Kabushiki Kaisha, 4, 1-Chome, Marunouchi, Chiyoda-ku, Tokyo, Japan.

LAS PESQUERIAS ESPAÑOLAS AUSTRO-ATLÁNTICAS, by V. Paz-Andrade, Unión Española de Armadores Pesqueros, Vigo, España.

Subject: GEAR RESEARCH

Topic: Mechanical and Hydro-Dynamic Theory

THE THEORY OF DESIGNING FISHING NETS AND TESTING THEM IN MODEL, by Tasae Kawakami, Department of Fisheries, Kyoto University, Maizuru, Japan.

FISHING METHODS AND GEAR RESEARCH INSTITUTES: THEIR ORGANIZATION AND SCOPE, by A. von Brandt, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

THE DEVELOPMENT OF A MIDWATER TRAWL, by P. Dale, Arbeidsutvalget for utvikling av Pelagisk embåtstrål (APE), Bergen, Norway, and S. Moller, Director, R & D Section, A. S. Bergens Mekaniske Verksteder, Bergen, Norway.

Topic: Instrumented Gear Testing

SOME JAPANESE INSTRUMENTS FOR MEASURING FISHING GEAR PERFORMANCE, by Chikamasa Hamuro and Kenji Ishii, both of Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

TRAWL STUDIES AND CURRENTS, by J. N. Carruthers, National Institute of Oceanography, Godalming, Surrey, England.

PERFORMANCE OF THE GRANTON TRAWL, by W. Dickson, Department of Agriculture and Fisheries for Scotland, Marine Laboratory, Torry, Aberdeen, Scotland.

TRAWL GEAR INSTRUMENTATION AND FULL-SCALE TESTING, by J. Nicholls, Westland Aircraft Ltd., Saunders-Roe Division, Isle of Wight, England.

Topic: Fish Behavior Studies

SHRIMP BEHAVIOR AS RELATED TO GEAR RESEARCH AND DEVELOPMENT, by Charles M. Fuss, Jr., U. S. Bureau of Commercial Fisheries, Gear Research Station, Panama City, Florida, U.S.A.

TUNA BEHAVIOR RESEARCH PROGRAM AT HONOLULU, by John J. Magnuson, U. S. Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Honolulu, Hawaii.

EVOLUTION DE LA PÊCHE À LA LUMIÈRE DANS LES LACS AFRICAINS, by A. Collart, FAO/EPTA, Economiste des Pêches, Cotonou, Dahomey.

UTILIZATION OF FISH REACTIONS TO ELECTRICITY IN COMMERCIAL SEA FISHING, by Conradin O. Kreutzer, Smith Research and Development Co., Inc., Lewes, Delaware, U.S.A.

THE USE OF AIR-BUBBLE CURTAINS AS AN AID TO FISHING, by Keith A. Smith, U. S. Bureau of Commercial Fisheries, Gloucester, Massachusetts, U.S.A.

AN EXPERIMENT ON THE DISPERSION OF CHUM, by Kentaro Hamashima, Nagasaki Prefectural Fishing Experimental Station, Nagasaki, Japan.

PROBLEMS OF ELECTRO-FISHING AND THEIR SOLUTIONS, by Jurgen Dethloff, Intelectron International Electronics GmbH, Hamburg, Federal Republic of Germany.

THE IMPORTANCE OF VISION IN THE REACTION OF FISH TO DRIFTNETS AND TRAWLS, by J. H. Blaxter, B.B. Parrish and W. Dickson, all of Department of Agriculture and Fisheries for Scotland, Marine Laboratory, Torry, Aberdeen, Scotland.

THE IMPORTANCE OF MECHANICAL STIMULI IN FISH BEHAVIOR, ESPECIALLY TO TRAWLS, by C. J. Chapman, Department of Agriculture and Fisheries for Scotland, Marine Laboratory, Torry, Aberdeen, Scotland.

PUMP FISHING FOR SAURY WITH LIGHT AND ELECTRIC CURRENT ATTRACTION, by I. V. Nikonov, Institute of Marine Fisheries and Oceanography (VNIRO), Moscow, U.S.S.R.

Topic: Application to Fisheries of Recent Advances in Telemetry, Computer Science, etc.

PROSPECTIVE DEVELOPMENTS IN THE HARVEST OF MARINE FISHES, by Dayton L. Alverson, U. S. Bu-

reau of Commercial Fisheries, Exploratory Fishing and Gear Research Base, Seattle, Washington, U.S.A., and Norman J. Wilimovsky, Institute of Fisheries, University of British Columbia, Vancouver, British Columbia, Canada.

AUTOMATIC DATA PROCESSING AND COMPUTER APPLICATION TO FISHERIES, by Benjamin F. Leeper, Univac Division of Sperry-Rand Corp., Baton Rouge, Louisiana, U.S.A.



MARYLAND PAN-FRIED OYSTERS

The home economists of the Bureau of Commercial Fisheries, Fish and Wildlife Service, U. S. Department of the Interior, recommend Maryland pan-fried oysters as a special treat for the family for their eating enjoyment.

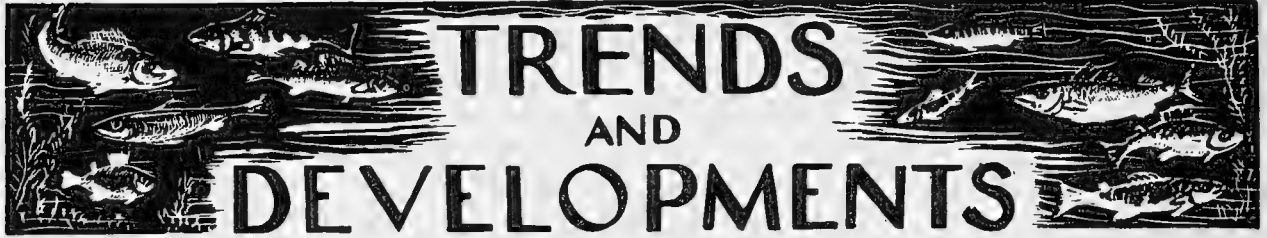
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|---|--------------------------|
| 2 cans (12 ounces each) fresh shucked oysters | 1½ cups dry bread crumbs |
| 2 eggs, beaten | 1½ cups flour |
| 2 tablespoons milk | Lemon wedges |
| 1 teaspoon salt | Tartar Sauce |
| Dash pepper | |

QUICK TARTAR SAUCE

| |
|-------------------------------------|
| 1 cup mayonnaise or salad dressing |
| ½ cup undrained sweet pickle relish |

Combine mayonnaise and relish; mix thoroughly. Chill.

Drain oysters. Combine egg, milk, and seasonings. Combine crumbs and flour. Roll oysters in crumb mixture. Dip in egg mixture and roll in crumb mixture. (A commercial breading may be used. Follow directions on the package.) Fry in hot fat at moderate heat until brown on one side. Turn carefully and brown the other side. Cooking time approximately 5 minutes. Drain on absorbent paper. Serve with lemon wedges and tartar sauce. Serves 6.



TRENDS AND DEVELOPMENTS

Alaska

SOVIET TRAWLERS RETURN TO GULF OF ALASKA:

In mid-March 1964, a fleet of Soviet trawlers and accompanying processing and support vessels were seen about 40 miles southwest of Yakutat, Alaska. That was the first observed appearance during 1964 of Soviet fishing vessels in the Gulf of Alaska. The fleet was probably trawling for Pacific Ocean perch, large concentrations of which were located off the Yakutat Bay area by Soviet exploratory fishing vessels in 1960 and 1961.

Although the sighting revealed a small fleet of less than 20 vessels, their appearance so far east may indicate an expansion of Soviet fisheries in the Gulf of Alaska in 1964. Large-scale Soviet fishing in the Gulf of Alaska began in 1962 and has been largely centered around the Kodiak Island area. The Soviets usually leave the Gulf of Alaska about the end of October apparently to avoid the severe winter storms.

* * * * *

BRISTOL BAY RED SALMON RUN FORECAST FOR 1964:

The Bristol Bay red salmon run will number approximately 19.3 million fish, according to an announcement in February by the Commissioner of the Alaska Department of Fish and Game. The forecast is based on a joint analysis of the available information by scientists of the Alaska Department of Fish and Game, the U. S. Bureau of Commercial Fisheries, and the Fisheries Research Institute.

Of the 19.3-million fish forecast, only about 8 or 9 million are expected to be available to United States fishermen, as out of the total run must come the necessary escapement plus the high-seas catch by the Japanese.

* * * * *

FOREIGN FISHING FLEETS IN BERING SEA INCREASE IN FEBRUARY:

The Soviet fleets fishing in the eastern Bering Sea, mainly northwest of the Pribilof Islands, continued to build up throughout February. Japanese fishing activities, however, remained at a low level.

More than 150 Soviet trawlers and associated support vessels were believed to be fishing in the Bering Sea in February. Major fishing emphasis was reportedly on herring and, to a lesser degree, flatfish and rockfish.

The Japanese shrimp factoryship Chichibu Maru and her accompanying trawlers returned to Japan in late December 1963 for a brief refit and were back fishing in the area north of Unimak Island in the Bering Sea by early February. Two stern trawlers of the Akebono Maru type were reported fishing in the same vicinity.

* * * * *

MARINE PLANTS AND ANIMALS IN SHALLOW COASTAL WATERS NEAR SITKA:

The shallow coastal waters near Sitka, Alaska, were studied for a one-week period this March by a team of diver-biologists from the U. S. Bureau of Commercial Fisheries Biological Laboratory at Auke Bay, Alaska. The major objective of the Sitka expedition was to obtain scientific information on marine plants and animals inhabiting open coast situations. In the past, study of that area has been limited to collecting from tide pools and fishing or dredging in deeper waters. Those methods are now regarded as quite crude and relatively unproductive. With the use of SCUBA equipment, diving biologists now can intensively observe, measure, and collect in regions below the tides.

The Bureau's scientific group was met at the Sitka State Ferry Terminal by members of the Alaska Department of Fish and Game who provided transportation for the divers to

and from the Bureau's oceanographic research vessel, the Murre II, which served as a base of operations for the expedition. From Sitka, the Murre II proceeded to nearby coastal points in the vicinity of Samsing Cove and Pirate Cove. The divers made both day and night dives at those areas to count, collect, and photograph the rich marine animal and plant life there.

Fish collections on this expedition contained 25 species, 5 of which have never been recorded before in Alaskan waters. These northward range extensions represent fish previously known only as far north as the Queen Charlotte Islands in British Columbia. Biologists made density estimates of fish populations by swimming transects and recording the numbers and kinds of fish sighted along the transect line.

Some of the divers counted octopus and obtained specimens for the Bureau's laboratory collection while other members of the expedition conducted a study of the subtidal distribution and density of the Sitka abalone. Collections were also made of other common and rare invertebrate species including sea stars, sea cucumbers and sea urchins.



Alaska Fisheries Exploration and Gear Research

TRAWLING EXPERIMENTS YIELD HEAVY SHRIMP CATCHES:

Experimental drags with a 10-foot trynet produced heavy catches of shrimp near Kasitsna Bay during early February. Drags of 15 minutes each yielded shrimp catches of 160 pounds. The pot-fishing gear for adult shrimp studies was changed from conventional bottom sets to sets of vertical strings so as to obtain information on vertical distribution of the shrimp.



American Samoa

JAPANESE GOVERNMENT ISSUES SPECIAL PERMIT TO LAND FIJI ISLANDS TUNA AT SAMOA:

The Japanese Fisheries Agency has issued a special permit (valid until June 1964) au-

thorizing the landing at American Samoa of tuna caught by Japanese tuna vessels (about 17) assigned to the base at Levuka, Fiji Islands. Reportedly, base facilities at Levuka are not expected to be completed until June. Also, one of the United States firms located at American Samoa is said to be faced with the problem of procuring an adequate supply of tuna due to the reluctance of Japanese tuna vessel operators to fish out of American Samoa since fishing in waters adjacent to that island is poor. (Nihon Suisan Shimbun, Feb. 17; Suisancho Nippo, Feb. 5, 1964.)



California

SEA OTTER POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 64-4-Special Project (February 13, 1964): To obtain a visual and photographic count of California sea otters (Enhydra lutris nereis), the California coastline from Morro Bay to Monterey was flown on the morning of February 13, 1964, by the California Department of Fish and Game's Beechcraft N5614D. Turbulent air necessitated flying at an altitude of about 250 feet, but visibility was excellent. One observer counted 339 sea otters, and another observer counted 351 sea otters in the area surveyed during the flight. The largest concentrations of sea otters were in the Carmel Bay area just below Cape San Martin.

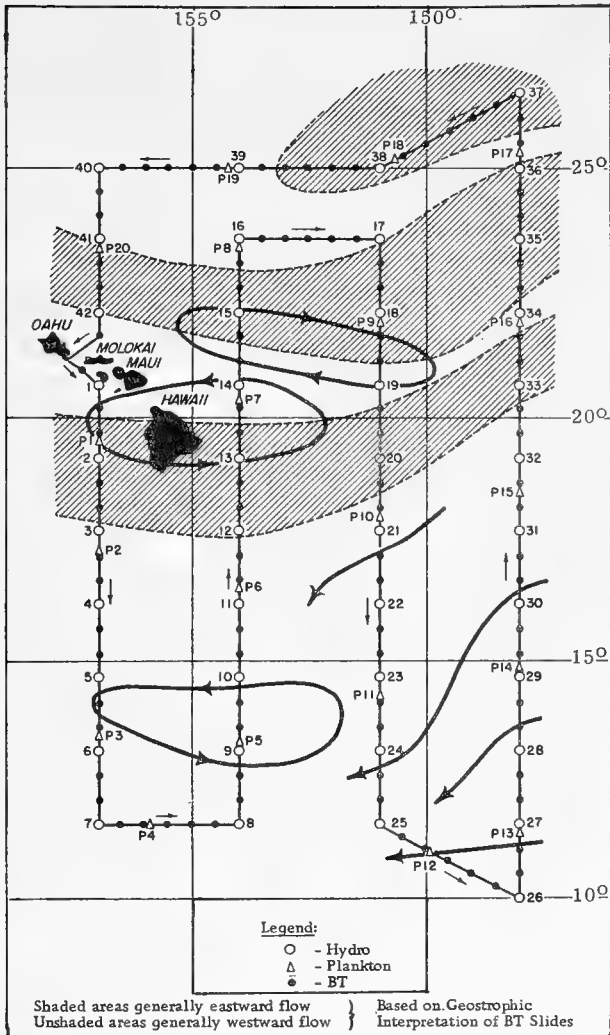
Note: See Commercial Fisheries Review, April 1964 p. 12.



Central Pacific Fisheries Investigations

NEW FISHERIES-OCEANOGRAPHIC RESEARCH VESSEL COMPLETES SUCCESSFUL MAIDEN VOYAGE:

M/V "Townsend Cromwell" Cruise 1 (February 14-March 6, 1964): The first scientific cruise of the Townsend Cromwell, the new fisheries-oceanographic research vessel operated by the Honolulu Biological Laboratory of the U. S. Bureau of Commercial Fisheries, was a success, announced the Bureau's Hawaii Acting Director on March 10, 1964. The vessel's three-week maiden voyage began on February 14, 1964, and was completed on March 6 when she returned to her base at Kewalo Basin, Honolulu, Hawaii. During the



Shows cruise track of research vessel Townsend Cromwell, February 14-March 6, 1964.

cruise she met with almost constant strong winds and rough seas.

The vessel cruised 4,500 miles and occupied its scheduled 42 oceanographic stations, sampling water temperatures and water chemistry down to depths of 4,500 feet throughout an area of 380,000 square miles to the east of the Hawaiian Islands. Detailed observations of weather were also recorded, and hauls were made with fine-meshed plankton nets to collect samples of the newly hatched larvae of skipjack (aku) tuna and other tuna species.

The first research cruise of the Townsend Cromwell also marked the initiation of a

new large-scale investigation of the trade wind zone waters around the Hawaiian Islands. According to the oceanographer in charge of the cruise, the trade winds are the most important wind system of the North Pacific Ocean, for they drive the ocean currents that carry warm water to the north and cool water to the equatorial region, thereby moderating the climates of western America and eastern Asia. The projected study will contribute to scientists' understanding of the mechanism by which the trade winds move the ocean's waters and will eventually improve the accuracy of forecasting of climatic trends in the sea and over the land. The trade winds are of direct importance to Hawaii's major fishery, for their strength and steadiness determine the type of water which the currents bring to bathe the Islands. This in turn determines whether fishing will be good or poor during the summer skipjack fishing season.

During this cruise, a standard watch for bird flocks and fish schools was maintained during daylight hours. Only scattered birds were seen throughout the cruise except east of Hawaii along 154° W. and north of the Islands along 157° W. where bird flocks were observed.

Note: See Commercial Fisheries Review, March 1964 p. 32.

* * * * *

PLANKTON STUDIES GIVE CLUES TO INDIAN OCEAN-ATLANTIC ZOOGEOGRAPHICAL RELATIONS:

Problems in the zoogeography of marine animals--their large-scale distribution in relation to geographic features--are interesting in themselves and of practical importance in several ways. The solution of such problems for example, may reveal the boundaries of resources of commercially-valuable fish, and thus contribute to the intelligent planning of fishery management measures. Zoogeographical studies can also lead to a better understanding of the biology of small animals that are important in the food chains of the larger creatures which man directly utilizes. When it comes to the zoogeography of planktonic animals, which have little or no power to move except as the currents carry them, study of the distribution of species provides valuable indications of the patterns of oceanic water circulation.

Recently, a marine biologist specializing in that type of "indicator organism" research

at the Biological Laboratory of the U. S. Bureau of Commercial Fisheries in Honolulu, Hawaii, discovered in his samples of small planktonic crustaceans evidence of a remarkably broad separation between certain animal populations of the equatorial Atlantic and the Indian Ocean. The biologist's studies are primarily concentrated on the copepods, which are small and somewhat shrimplike animals, individually well under an inch in length, but in the aggregate bulking very large in the economy of the sea and the food chains of most oceanic fishes. The biologist had earlier found that certain species of one family of copepods, the Candaciidae, in the central Pacific Ocean showed quite distinct patterns of occurrence, coinciding with the major patterns of circulation of the ocean waters.

Participation of the Bureau's Honolulu Biological Laboratory staff in the International Indian Ocean Expedition is providing an opportunity to discover whether similar copepod-ocean current relations are to be found in other parts of the world's oceans. United States research vessels, in the course of their 1963-64 schedule of biological field work, will collect more than two thousand samples of Indian Ocean plankton. Study of the copepods in those collections is already under way, and it appears from the preliminary findings that in the Indian Ocean, as in the Pacific, certain species of the family Candaciidae are associated with waters of certain temperature and salinity characteristics. For example, the distributions of some copepods are associated with water of the type found primarily in the Arabian Sea, while others are indicators of the equatorial water or the south-central water of the Indian Ocean.

It is known that water from the equatorial regions of the Indian Ocean flows south along the southeast coast of Africa as the Agulhas Current. During the southern summers this current may extend around the Cape of Good Hope to the South Atlantic, and thus afford a possible avenue for equatorial Indo-Pacific plankton animals to reach the Atlantic and mingle there with their counterparts in the Atlantic plankton. It has not been known, however, how far west the influence of the Agulhas Current reaches, nor consequently whether mixing of the equatorial Indian Ocean and Atlantic faunas actually occurs.

The Bureau's laboratory planktologist has found, by examining the candaciid copepods in collections taken around the coasts of South Africa by the research ship Vema of the Lamont Geological Observatory, Columbia University, that the transport of Indo-Pacific equatorial plankton into the Atlantic appears to be small. Although copepods typical of the tropical Indian Ocean were common in the Agulhas Current off the southeastern coast of Africa, they faded out of the samples before the Cape of Good Hope was reached. A conjecture was that the few animals which may reach the southern tip of Africa either are carried by the currents onto shallow coastal banks and die of inshore conditions to which they are not adapted or are turned back eastward by encountering the West Wind Drift. If any survived those obstacles and passed the Cape, they would then fall in with the cold, upwelled waters of the Benguela Current, extending 200 to 300 miles offshore along the southwestern coast. This cold current was found to be heavily populated by Antarctic and inshore species of plankton.

The copepod species used by the biologist as indicators of equatorial Indian Ocean water did not turn up in Atlantic collections any farther south than the Gulf of Guinea, which meant that more than 1,500 miles separated the Indian Ocean and Atlantic populations. This distance implies a genetic isolation that might be expected to result in anatomical differences between specimens of the same species from the two oceans. A search for such differences is now being made and, if found, they will support the hypothesis of independent plankton populations in the Indian Ocean and the equatorial Atlantic.



Exports

**SHRIMP VESSEL EQUIPMENT SOLD
TO COLOMBIA FIRM BY
UNITED STATES COMPANY:**

A company in Savannah, Ga., has arranged to sell shrimp vessel equipment to a firm in Colombia. The transaction with the South American firm involves several hundred thousand dollars. Export insurance for the contract was provided by the U. S. Export-Import Bank in the form of a 4-year credit guarantee, which was negotiated with the assistance of the Savannah Regional Export

Expansion Committee of the U. S. Department of Commerce. (International Commerce, March 2, 1964.)



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-FEBRUARY 1964;

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, more fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers in January 1964 than in the previous month. The increase was 25.6 percent in quantity and 21.7 percent in value. Compared with the same month in the previous year, purchases in January 1964 were up 0.9 percent in quantity but down 29.6 percent in value. The purchases in January 1963 had the exceptionally high average value of 74.0 cents per pound due to large purchases of shrimp.

Purchases in February 1964 were up 17.1 percent in quantity and 15.3 percent in value from those in the same month in 1963.

Total purchases in the first 2 months of 1964 were up 8.8 percent in quantity but down 11.3 percent in value from those in the same period of the previous year. In 1964, there were larger purchases of flounder fillets, ocean perch fillets, and oysters, but smaller purchases of shrimp, haddock fillets, sole fillets, and halibut steaks. In addition, the average wholesale price of shrimp in early 1964 was down sharply from the levels maintained in January-February 1963.



Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, January-February 1964 with Comparisons

| QUANTITY | | | | | | VALUE | | | | | |
|--------------|-------|----------|-------|-----------|-------|-----------|-------|----------|-------|-----------|-------|
| January | | February | | Jan.-Feb. | | January | | February | | Jan.-Feb. | |
| 1964 | 1963 | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 |
| (1,000 Lbs.) | | | | | | (\$1,000) | | | | | |
| 2,108 | 2,089 | 2,300 | 1,964 | 4,408 | 4,053 | 1,088 | 1,546 | 1,231 | 1,068 | 2,319 | 2,614 |

Table 2 - Selected Purchases of Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, January-February 1964 with Comparisons

| Product | January | | February | | Jan.-Feb. | |
|----------------------|-----------|---------|-----------|---------|-----------|-----------|
| | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 |
| (Pounds) | | | | | | |
| Shrimp: raw headless | 83,500 | 2/ | 99,400 | 2/ | 182,900 | 2/ |
| peeled and deveined | 73,850 | 2/ | 110,900 | 2/ | 184,750 | 2/ |
| breaded | 288,800 | 2/ | 349,200 | 2/ | 638,000 | 2/ |
| Total shrimp | 446,150 | 737,817 | 559,500 | 394,526 | 1,005,650 | 1,132,343 |
| Scallops | 172,750 | 154,800 | 218,350 | 245,000 | 391,100 | 399,800 |
| Oysters: Eastern | 99,954 | 2/ | 105,434 | 2/ | 205,388 | 2/ |
| Pacific | 30,200 | 2/ | 21,930 | 2/ | 52,130 | 2/ |
| Total oysters | 130,154 | 102,474 | 127,364 | 90,973 | 257,518 | 193,447 |
| Clams | 37,448 | 26,570 | 39,060 | 44,386 | 76,508 | 70,956 |
| Fillets: | | | | | | |
| Cod | 33,196 | 23,944 | 71,350 | 93,294 | 104,546 | 117,238 |
| Flounder | 529,744 | 292,200 | 328,072 | 285,920 | 857,816 | 578,120 |
| Haddock | 1/138,594 | 261,880 | 3/221,650 | 233,040 | 4/360,244 | 494,920 |
| Ocean Perch | 276,000 | 225,240 | 386,600 | 323,092 | 662,600 | 548,332 |
| Sole | - | 70,430 | - | 31,502 | - | 101,932 |
| Steaks: | | | | | | |
| Halibut | 106,525 | 102,605 | 88,000 | 147,515 | 194,525 | 250,120 |
| Salmon | 13,157 | 7,250 | 10,410 | 26,880 | 23,567 | 34,130 |
| Swordfish | 800 | 1,250 | 1,900 | 1,800 | 2,700 | 3,050 |

1/Includes 8,000 pounds of haddock portions.
 2/Breakdown not available.
 3/Includes 650 pounds of haddock portions.
 4/Includes 8,650 pounds of haddock portions.

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, January-February 1964 with Comparisons

| Product | QUANTITY | | | | | | VALUE | | | | | |
|----------|--------------------------|------|----------|------|-----------|------|-----------------------|------|----------|------|-----------|------|
| | January | | February | | Jan.-Feb. | | January | | February | | Jan.-Feb. | |
| | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 |
| | (1,000 Lbs.) | | | | | | (\$1,000) | | | | | |
| Tuna | 650 | - | 278 | 10 | 928 | 10 | 285 | - | 123 | 6 | 408 | 6 |
| Salmon | 679 | 3 | 1/ | 3 | 679 | 6 | 416 | 2 | 2/ | 2 | 416 | 4 |
| Sardines | 20 | 37 | 40 | 57 | 60 | 94 | 8 | 15 | 14 | 24 | 22 | 39 |

1/Less than 500 pounds.
2/Less than \$500.

Canned: In the first 2 months of 1964, there were substantial purchases of canned tuna, canned salmon, and canned sardines for the use of the Armed Forces. Of the 3 principal canned fishery products (tuna, salmon, and sardines), only sardines were purchased in sizable quantity in January-February 1963.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual local purchases are higher than indicated because local purchases are not obtainable.

(2) See Commercial Fisheries Review, April 1964 p. 14.



Fishy Flavors and Odors

CHEMISTRY OF VOLATILE COMPONENTS IN FISHERY PRODUCTS STUDIED:

The most reliable procedures now being used for determining the quality of fish and fishery products are dependent upon organoleptic evaluations (smell, taste, appearance). Such examinations give only a superficial quality indication depending entirely on the subjective judgment of the examiner. For most purposes this method is satisfactory but it provides no information regarding the chemical reactions that produce undesirable flavors and odors in fish. The mechanism of flavor and odor development is extremely complex. An understanding of the fundamental spoilage reactions is essential to reduce the development of undesirable fish odors and flavors and improve product quality.

Studies on the chemistry of the volatile odor and flavor components in raw and cooked haddock fillets and clam meats are being conducted by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass. Some of the necessary preliminary planning for the project included the purchase and construction of specialized equipment for handling extremely small quantities of very volatile compounds. Precise sampling techniques had to be developed to handle and transfer those small quantities for analysis.

Most of the compounds in the flavor and odor components of fishery products are made up of sulfides, carbonyls, and amines. Techniques for identifying the sulfides and carbonyls from flavor and odor mixtures are being investigated in an effort to relate concentrations of those compounds to fish quality. Investigations using gas chromatography have been successful in identifying several sulfide compounds (dimethylsulfide, hydrogen sulfide, and dimethyldisulfide). Colorimetric methods for total sulfide and infrared spectrophotometry for compound identification are also being investigated. Through the use of wet chemistry in conjunction with gas chromatography, volatile carbonyl compounds in clam meats have been separated. A method which permits concentration of the carbonyls using the Girard-T reagent, use of a regeneration process, and subsequent introduction into the gas chromatograph, has resulted in the detection of at least 18 carbonyl compounds in clam meats. Prior to development of this procedure, a maximum of 8 carbonyls had been detected.

Future investigations will include the identification of carbonyl compounds by mass spectrometry, investigation and identification of amines, and the investigation of odor and flavor components of other fish such as cod, pollock, and ocean perch. Also, studies will be made to determine how the odor and flavor components can be controlled or altered to increase the quality and storage life of fishery products.



Great Lakes

MIDWEST FEDERATED FISHERIES COUNCIL ORGANIZED:

The Midwest Federated Fisheries Council, an organization of existing fisheries associations in the Middle West, has been incorporated to give better representation to the fishing industry in the Great Lakes and midwestern

rivers region, and to coordinate the promotion of fishery products by the individual organizations. The Council was formed through the combined efforts of representatives of the commercial fishermen, wholesalers, brokers, processors, and large retailers.

The first objective of the Council is to seek legislation in Congress that will bring some stability to the fresh-water fisheries. All segments of the industry from the producers to the retailers have suffered in recent years because of the depredation of the sea lamprey, and unexpected marketing problems.

The affairs of the Council will be governed by a Board of Directors made up of two representatives from each of the six incorporating organizations. Provisions have been made to accept additional organizations and to provide representation on the Board of Directors. The six incorporating organizations establishing the Council are: The Seafood Club of Chicago, Michigan Fish Pro-

ducers Association, Ohio Commercial Fishermen's Association, Minnesota Fisheries Council, Wisconsin Fisheries Council, and the Fisheries Council of the Great Lakes.

A meeting was planned in Chicago, Ill., early in April 1964 to complete the organization of the Council and to outline in more detail the immediate objectives.



Great Lakes Fisheries Exploration and Gear Research

TRAWLING INVESTIGATIONS IN SOUTHERN LAKE MICHIGAN:

M/V "Kaho" Cruise 15 (Phase I--December 16-20, 1963; Phase II--January 28-February 6, 1964; Phase III--March 3-12, 1964): Investigations to determine the effects of environmental conditions on distribution of fish,

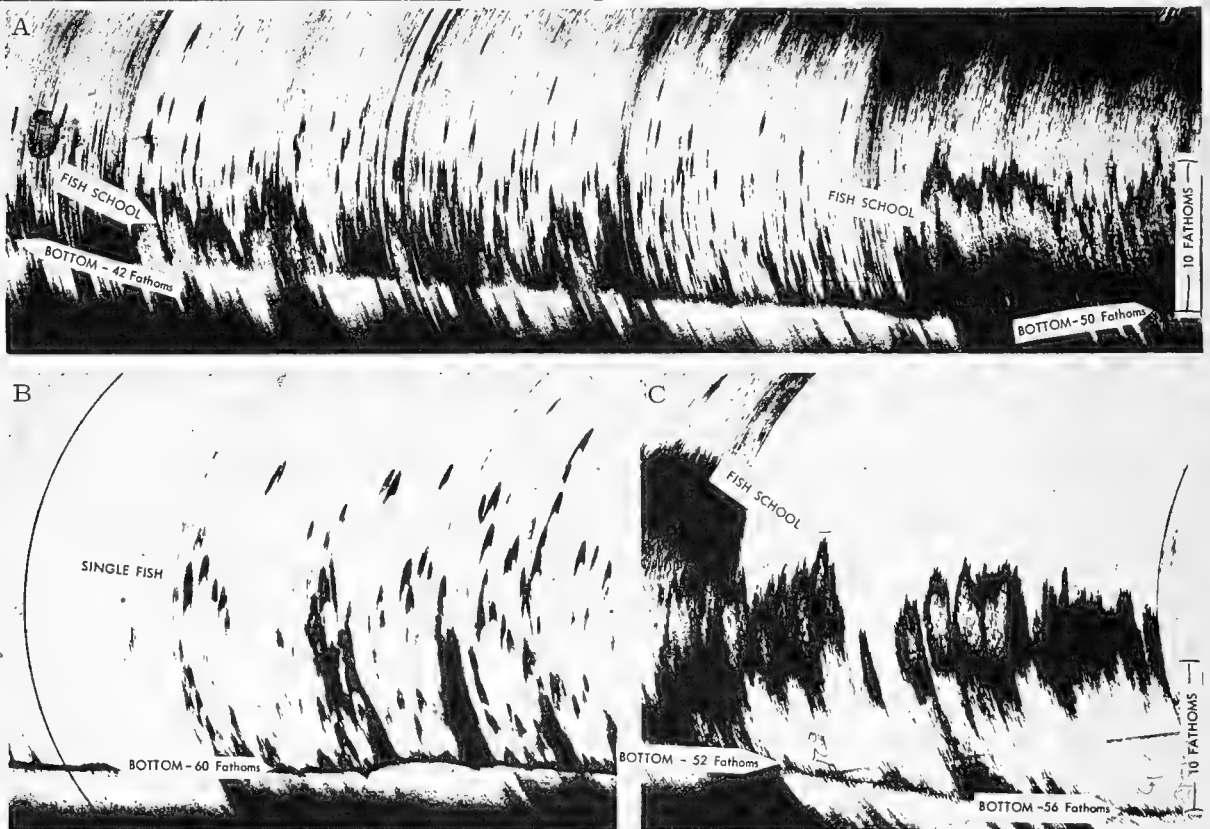


Fig. 1 - Echograms from a high resolution echo-sounder showing concentrations of fish on bottom and at midwater levels in southern Lake Michigan during M/V *Kaho* Cruise 15. A - Distribution of fish from 42 to 50 fathoms; distance traveled is 5 nautical miles at 9 knots. B - Vertical dispersion of fish at midwater levels; distance traveled is 1.5 nautical miles at 2.5 knots. C - Midwater concentrations of fish; distance traveled is 1.1 nautical miles at 9 knots.

availability to bottom trawls, and performance of bottom trawls were conducted by the U. S. Bureau of Commercial Fisheries exploratory fishing and gear research vessel Kaho in southern Lake Michigan during a three-phase cruise--December 16-20, 1963, January 28-February 6, and March 3-12, 1964. The primary objective was to study trawl performance as affected by the direction of towing in relation to water currents. The secondary objective was to obtain addi-

tional information on the seasonal effectiveness of trawls at previously established stations in southern Lake Michigan.

The cruise was highlighted during Phases II and III by the location of unusually high concentrations of alewife between 35 and 60 fathoms off Saugatuck, Mich. (fig. 1). Local commercial trawlers, following up on the information, have enjoyed productive fishing never before experienced at those depths and that time of year. During February 6-March 19, 1964, three commercial fishing vessels landed about 428,000 pounds and averaged some 9,400 pounds per hour of fishing effort.

During past explorations, large deviations in catch rate between drags made in alternating north and south direction have been noted. The results of recent limnological surveys indicate that currents in the south basin of Lake Michigan are dependent upon prevailing wind conditions which cause water currents to exceed one knot for many hours on occasion and may be either clockwise or counter-clockwise. Although other factors influence the catch rate, consistent large fluctuations make it reasonable to believe that catch rates are affected by those currents. Information regarding the influence from lake current may enable commercial trawl fishermen to account for large discrepancies in individual trawl catches.

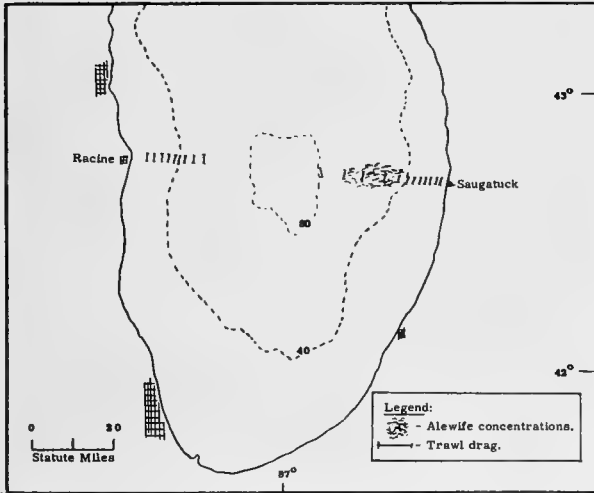


Fig. 2 - Shows area of operations in Lake Michigan by M/V Kaho during Cruise 15 (December 16, 1963-March 12, 1964).

| Date | Depth | North Drag | | | | South Drag | | | | Percentage Increase or Decrease South to North |
|----------|-------|------------|------|--------|-------|------------|------|--------|-------|--|
| | | Alewife | Chub | Others | Total | Alewife | Chub | Others | Total | |
| 12/17/63 | 17 | 120 | 15 | 10 | 145 | 860 | 34 | 26 | 920 | +534.4 |
| 12/17/63 | 17 | 150 | 9 | 1 | 160 | 445 | 14 | 21 | 480 | +200.0 |
| 1/30/64 | 5 | - | - | 30 | 30 | - | - | 65 | 65 | +116.6 |
| 1/30/64 | 10 | - | - | 100 | 100 | - | - | 120 | 120 | + 20.0 |
| 1/30/64 | 15 | - | - | 240 | 240 | - | - | 340 | 340 | + 41.6 |
| 1/30/64 | 20 | - | 16 | 24 | 40 | - | 14 | 21 | 35 | - 14.2 |
| 1/30/64 | 25 | - | 128 | 2 | 130 | - | 203 | 7 | 210 | + 61.5 |
| 1/31/64 | 30 | 15 | 254 | 6 | 275 | 45 | 215 | - | 260 | - 5.8 |
| 2/3/64 | 35 | 3,000 | 30 | - | 3,030 | 3,400 | 25 | - | 3,425 | + 13.0 |
| 2/3/64 | 40 | 2,400 | 60 | - | 2,460 | No Effort | | | | |
| 3/10/64 | 10 | - | - | 55 | 55 | - | - | 42 | 42 | - 30.9 |
| 3/10/64 | 15 | 10 | 2 | 73 | 85 | 5 | - | 75 | 80 | - 6.3 |
| 3/3/64 | 20 | 1 | 20 | 14 | 35 | 1 | 20 | 14 | 35 | 0.0 |
| 3/3/64 | 25 | 1 | 186 | 28 | 215 | 1 | 140 | 14 | 155 | - 38.7 |
| 3/3/64 | 30 | 5 | 200 | 15 | 220 | 2 | 80 | 3 | 85 | -158.8 |
| 3/3/64 | 35 | 650 | 110 | 5 | 765 | 500 | 80 | 5 | 585 | - 30.8 |
| 3/3/64 | 40 | 400 | 80 | 5 | 485 | 80 | 55 | 5 | 140 | -246.4 |
| 3/4/64 | 45 | 1,900 | 100 | - | 2,000 | 1,000 | 114 | 6 | 1,120 | - 78.6 |
| 3/4/64 | 50 | 1,300 | 100 | - | 1,400 | 1,100 | 100 | - | 1,200 | - 16.7 |
| 3/4/64 | 60 | 300 | 100 | - | 400 | 700 | 110 | 5 | 815 | +103.7 |
| 3/6/64 | 70 | 510 | 80 | 10 | 600 | No Effort | | | | |
| 3/11/64 | 80 | 140 | 35 | 95 | 270 | No Effort | | | | |

Although the study of the effects of lake currents was the primary consideration this cruise, other information and samples of fish were collected as follows: (1) differential in east-west seasonal abundance and distribution of alewife and chubs, (2) availability of all species to bottom trawls, (3) seasonal length-frequency data of alewife and chubs to supplement material collected earlier for biological research, (4) collection of fish, water, and bottom samples for subsequent laboratory analysis in connection with botulism studies, and (5) collection of fish samples from various depths between 5 and 50 fathoms for life history studies.

Excellent exploratory catches of alewife were taken at 20 fathoms during Phase I, at 35 and 40 fathoms during Phase II, and at 40 to 60 fathoms during Phase III, but only along the east shore. Fair catches of chubs were taken at 15 fathoms off Saugatuck during Phase II and at 25 and 30 fathoms during Phase III. Best catches of chubs were obtained off Racine, Wis., during Phase III at 30 to 50 fathoms.

FISHING OPERATIONS: A total of 60 trawl drags was completed with a 52-foot (headrope) fish trawl during 13 days of operation--43 drags were completed off Saugatuck from 5 to 80 fathoms and 17 were made from 15 to 60 fathoms off Racine. All drags except 4 were paired tows of 30 minutes¹ duration and made in alternating north and south directions. Adequate warp length versus depth was employed to insure good bottom contact; and shaft r.p.m. remained constant. No gear damage was sustained dur-

ing the cruise. Bottom topography and bathymetric distribution of fish were continuously recorded with a high resolution type depth recorder.

FISHING RESULTS: The study revealed that the direction of drag in relation to the observed current may consistently increase or decrease the catch by over 50 percent (tables 1 and 2). During Phases I and II, trawl drags made off Saugatuck in a south course were generally more productive than those completed in a northerly direction. Exceptions occurred at 20 to 30 fathoms, but those differences are slight in comparison to others and could be attributed to other gear inconsistencies. During Phase III, this drag-current relationship was reversed and tows made off Saugatuck in a north direction between 10 and 50 fathoms were more productive than those made in the opposite direction. Off Racine, drags completed in a southerly direction were more productive, which is indicative of the counter-clockwise current in effect during the latter operations.

The investigations completed along the lakewide transect between Saugatuck, Mich., and Racine, Wis., revealed significant differences in depth distribution, abundance, and species interrelationship from one side of the lake to the other. The most outstanding features were the almost total absence of alewife from catches off Racine and the extremely large concentrations of that species off Saugatuck. The alewife dominated catches in that area at 17 fathoms during Phase I and from 35 to 80 fathoms during Phases II and III.

Table 2 - Summary of Catch Rate, Species Composition, and Percentage Differential by Direction of Trawl Drag Taken off Racine, Wisconsin, during Kaho's Exploratory Cruise 15, March 3-12, 1964

| Date | Depth | North Drag | | | | South Drag | | | | Percentage Increase or Decrease South to North |
|--------|-------|------------|------|--------|-------|------------|------|--------|-------|--|
| | | Alewife | Chub | Others | Total | Alewife | Chub | Others | Total | |
| 3/7/64 | 15 | - | 5 | 15 | 20 | - | 10 | 20 | 30 | +50.0 |
| 3/7/64 | 20 | - | 12 | 8 | 20 | - | 7 | 13 | 20 | 0.0 |
| 3/7/64 | 25 | - | 50 | 10 | 60 | 2 | 80 | 13 | 95 | +58.3 |
| 3/7/64 | 30 | - | 195 | 5 | 200 | - | 200 | 5 | 205 | + 2.5 |
| 3/7/64 | 35 | 3 | 295 | 2 | 300 | - | 425 | 5 | 430 | +43.3 |
| 3/7/64 | 40 | 1 | 108 | 1 | 110 | 1 | 188 | 1 | 190 | +72.7 |
| 3/8/64 | 45 | 5 | 165 | 5 | 175 | 5 | 310 | 5 | 320 | +82.8 |
| 3/8/64 | 50 | 20 | 245 | 10 | 275 | 10 | 400 | 10 | 420 | +52.7 |
| 3/9/64 | 60 | 1 | 79 | 20 | 100 | No Effort | | | | |

Chub catches were good (300-425 pounds per half-hour drag) off Racine at 35 to 50 fathoms but only fair (200-250 pounds per half-hour drag) off Saugatuck at 25 and 30 fathoms. Only one catch contained another species in significant quantity, and that was 319 pounds of yellow perch at 15 fathoms off Saugatuck.

Table 3 - Other Species Taken in Lake Michigan by M/V Kaho

| Species | No. of Drags Yielding | Pounds/Drag | Combined Catch (Pounds) |
|-----------------|-----------------------|-------------|-------------------------|
| Herring | 19 | 2 to 35 | 169 |
| Sculpin | 43 | 1 to 94 | 233 |
| Smelt | 24 | 1 to 10 | 79 |
| Spottail shiner | 19 | 1 to 10 | 47 |
| Stickleback | 3 | 1 | 3 |
| Sturgeon | 1 | 5 | 5 |
| Sucker | 3 | 2 to 7 | 16 |
| Trout-perch | 20 | 1 to 3 | 26 |
| Trout | 1 | 2 | 2 |
| Whitefish | 7 | 1 to 7 | 18 |
| Yellow perch | 22 | 1 to 319 | 958 |

HYDROGRAPHIC DATA: Bathythermograph casts were made at each station, and air and surface water temperatures were recorded continuously. Surface water temperatures ranged from 32.0° to 36.0° F. throughout the cruise period, and bottom temperatures ranged from 36.0° to 40.0° F.

M/V "Kaho" Cruise 16 (March 31-April 9, 1964): To extend knowledge on the seasonal distribution, abundance, and availability of the alewife and chub stocks in central and southern Lake Michigan to bottom trawls was to be the primary objective of this 10-day cruise by exploratory fishing and gear research vessel Kaho.



Gulf Exploratory Fishery Program

SHRIMP AND MENHADEN INVESTIGATIONS IN THE GULF OF MEXICO CONTINUED:

M/V "Oregon" Cruise 90 (February 17-March 13, 1964): The main objectives of this 26-day cruise along the Louisiana coast by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon were to: (1) obtain comparative data on the seasonal availability of brown shrimp (Penaeus aztecus), pink shrimp (P. duorarum), white shrimp (P. setiferus), and royal-red shrimp (Hymenopenaeus robustus); (2) investigate off-season menhaden resources; and (3) conduct deep-water faunal trawling transects in

the northern area of the Gulf of Mexico.

Catches of white and brown shrimp were light and scattered, with most counts (heads-off) in the 21-25 and 26-30 ranges. Very few pink shrimp were taken. White shrimp were found in 6 to 20 fathoms and brown shrimp in 16 to 52 fathoms.

Royal-red shrimp were caught in light numbers between 220 and 300 fathoms, with drags in 220 to 230 fathoms yielding the best results. The largest catch of royal-red shrimp in a single 2-hour tow amounted to 26 pounds (heads-on). Heavy seas and rough bottom were encountered during much of the deep-water trawling.

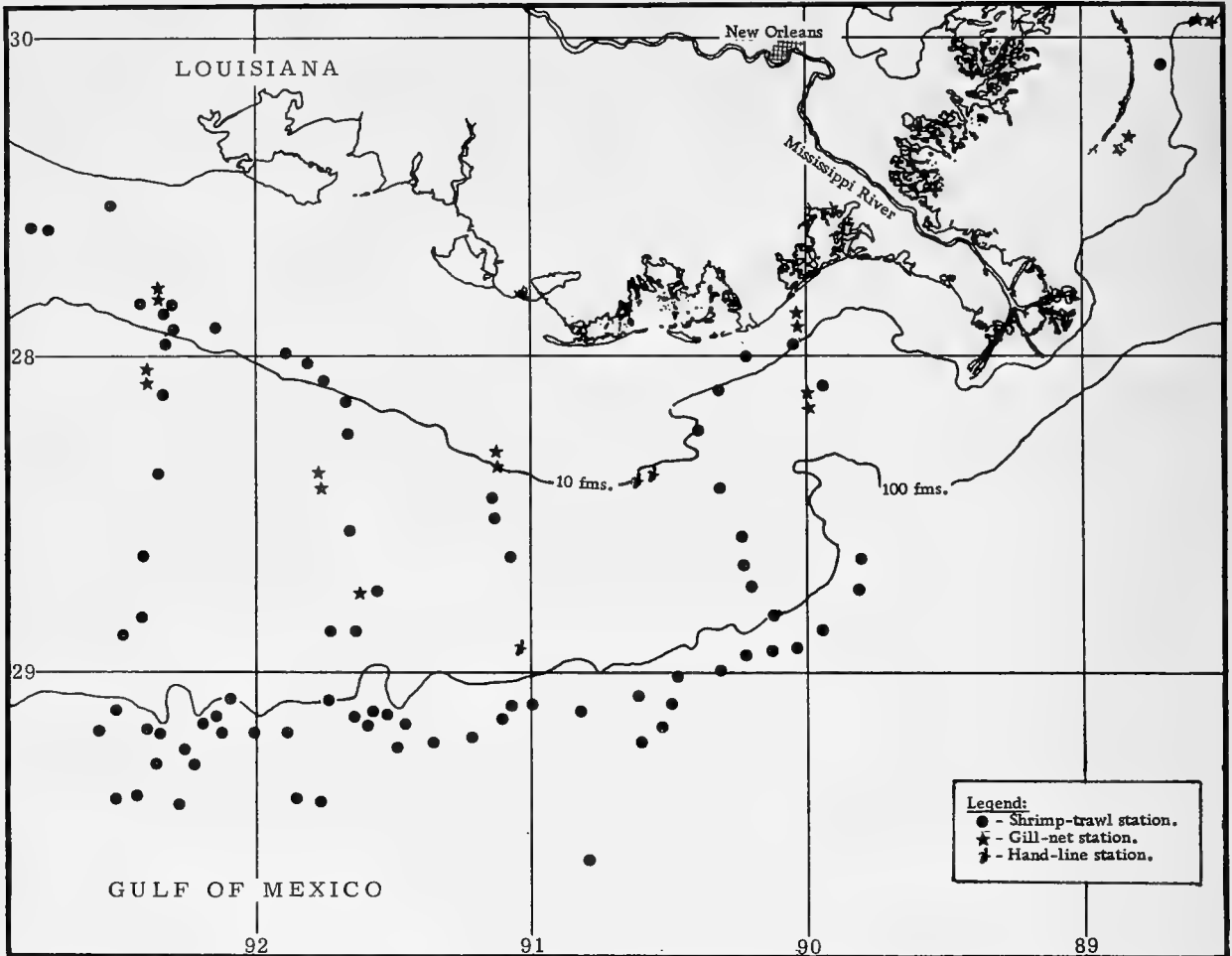
Both inshore and offshore shrimp concentrations found on this cruise off Louisiana were comparable to those found during the exploratory cruise of the Oregon along the Texas coast in February and early March 1964.

The fish catch from inshore trawling was dominated by sciaenid and sparid fishes, notably croaker (Micropogon undulatus) and the long-spined porgy (Stenotomus caprinus). Offshore drags were dominated by gadiforme fishes such as Merluccius species and Urophycis species.

Seventeen gill-net stations were occupied. A total of 8 bottom sets and 9 surface sets were made in depths ranging from 6½ to 38 fathoms. The gill nets used contained No. 7 monofilament nylon thread, made up in four 300-foot sections of 2⅝-, 2¾-, 2⅞-, and 3-inch stretched mesh. Seven large-scale menhaden (Brevoortia patronus) were caught in bottom sets, 48 were taken in surface sets, and an additional 34 were taken in 65-foot flat trawl drags in shallow water. Twenty-nine bathythermograph casts were made in conjunction with the gill-net sets.

A series of mud samples was collected from selected areas within commercial shrimp grounds for viscosity, adhesiveness, and friction evaluation in connection with a study on the stimulation and response behavior of burrowed shrimp under electrical trawling conditions.

Forty-three plankton tows were made for the U. S. Bureau of Commercial Fisheries Biological Laboratory in Beaufort, N. C.,



M/V Oregon Cruise 90 (February 17-March 13, 1964).

which is also studying menhaden. An additional 12 plankton tows were made for the Florida State Board of Conservation in cooperation with their studies on the distribution of spiny lobster larvae.

Note: See Commercial Fisheries Review, April 1964 p. 17.

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-14 (February 8-March 3, 1964) and M/V "Belle of Texas" Cruise BT-33 (February 18-24, 1964): Shrimp sampling studies as well as pink shrimp marking were carried out during these cruises by the chartered research vessels Gus III and Belle of Texas of the U. S. Bureau of

Commercial Fisheries Biological Laboratory, Galveston, Tex.

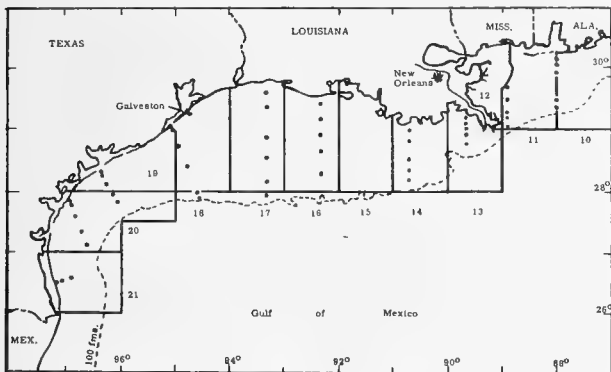
During shrimp sampling in the northwestern Gulf of Mexico, 8 statistical areas (13, 14, 16, 17, 18, 19, 20, and 21) off Louisiana and Texas were covered, with the Gus III surveying eastern stations and the Belle of Texas covering western stations. Standard 3-hour tows with a 45-foot shrimp trawl were made. Shrimp catches were spotty. The only good catch of brown shrimp consisted of 46 pounds of 12-15 count taken at a 25-fathom station off Cameron, La. White shrimp catches consisted mainly of the 41-50 count size which were found off the Texas coast in less than 10-fathom depths of area 18 (26 pounds), area 19 (34 pounds), and area 20 (21 pounds). Area 20 also yielded 34 pounds of 21-25 count white shrimp from 10-20 fathoms. Pink shrimp

were found in only 2 tows, and in both cases the quantity was less than 1 pound.

During the combined cruises of the Gus III and the Belle of Texas, 66 bathythermograph casts were made including 26 on the Tortugas shrimp grounds. Ten special plankton-sled tows on the bottom and 40 regular oblique-step plankton tows in mid-depths were completed. Between the Mississippi Delta and Key West, Fla., 10-drift-bottle stations were established and 12 drift bottles were released at each station.

In addition to shrimp-sampling work, the Gus III completed a pink-shrimp marking study on the Tortugas shrimp grounds off south Florida. Approximately 3,000 pink shrimp were captured, stained, and released.

M/V "Gus III" Cruise GUS-15 (February 28-March 3, 1964 and March 17-22, 1964): Shrimp catches were generally spotty during this cruise in the Gulf of Mexico by the chartered research vessel Gus III. The cruise was conducted in two separate portions within the area of operations extending from off the coast of Louisiana westward to lower Texas. Standard 3-hour tows with a 45-foot shrimp trawl were made in each of the statistical areas covered.



Shows station pattern of M/V Gus III during cruise GUS-15, February 28-March 3, 1964.

White shrimp catches were fair in the 0-10 fathom depth of area 14 (18 pounds of 26-30 count), area 16 (10 pounds of 15-20 count), and area 20 (21 pounds of 31-40 count). The 10-20 fathom depth in area 13 yielded 13 pounds of brown and white shrimp about evenly divided between sizes 15-20 and 26-30 count. The largest catch of brown shrimp (18 pounds of 31-40 count) during the cruise was from that depth in area 19.

During the two portions of this cruise, 51 bathythermograph and 39 nansen bottle casts were made. A total of 29 special plankton-sled tows on the bottom and 50 oblique-step plankton tows were also completed.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, Apr. 1964 p. 19.



Hawaii

SKIPJACK TUNA LANDINGS, FEBRUARY 1964:

Skipjack tuna landings in Hawaii in February 1964 were about 280,000 pounds. This was 73,000 pounds above the 1948-1963 average for the month. The cumulative catch in January-February 1964 was about 755,000 pounds, or 249,000 pounds above the 1948-1963 average for the 2-months period.

During February 1964 there were 78 productive trips giving an average of 3,590 pounds per trip. Individual catches ranged from 90 pounds to 12,550 pounds. Oahu-based vessels landed 79 percent of the total catch.



Industrial Fishery Products

USE OF FISH REDUCTION PRODUCTS IN POULTRY AND ANIMAL NUTRITION HIGHLY REGARDED:

Mixed feed manufacturers in Delaware, New Jersey, New York, and Pennsylvania, were visited during February 3-11, 1964, by the Chief of the U. S. Bureau of Commercial Fisheries Technical Advisory Unit and the Animal Nutritionist attached to the Unit. Also visited at that time were Agricultural Experiment Stations in those States with the exception of New Jersey, and a visit was made to the Connecticut Agricultural Experiment Station. Observations made by the two nutritionists during the trip and conclusions based on those observations follow:

Practically all the feed-mill officials visited expressed very high regard for fishery by products in poultry and swine nutrition. A definite preference for United States-produced fish meal was expressed by nearly every feed manufacturer visited, the reason usually given for such preference being greater uniformity of the product. There seems to be a general agreement among industrial nutritionists that the most economical poultry and swine rations, all things considered, are those that are supplied with reasonably liberal amounts of fish meal. But this has not always been true, as one research director visited during the trip observed. For example, only two years ago some nutritionists believed that economies could be effected by omitting fish meal and instead enriching feed mixtures made up entirely of grains and other materials of vegetable origin with synthetic amino acids. Experience has shown that the rations lacking fish meal are

not equal to those containing the fish product and that such omission from poultry rations is false economy.

Levels of fish meal utilization were found to be quite liberal in the area visited. At mills relatively near reduction plants, average utilization is around 7 percent in broiler rations whereas in broiler rations produced by mills farther from fish meal supplies it is around 5 percent. The use of fish meal is relatively liberal in rations for young pigs in Pennsylvania, a typical commercial ration in that State containing 2.5 percent fish meal. However, about twice that level is recommended by experiment station workers at the Pennsylvania State University. Rations are based upon University recommendations containing 5 percent fish meal both in prestarter and starter rations. Pennsylvania leads in pork production among the northern Atlantic Coast States.

A large feed mill in New York State produces a fish food that is 25 percent fish meal and, in addition, incorporates fish meal in rations for laboratory animals.

A possible valuable effect of fish meal on ruminants was suggested to a professor of the Agricultural Experiment Station, University of Delaware (Newark), by a practical livestock man. The suggestion was the feeding of fish meal to prevent cracked hooves in cattle. The professor pointed out that such suggestions, on further investigation, are often found to have practical value. The experiment station workers visited on the trip are, without exception, enthusiastic about the values of industrial fish products in poultry and animal nutrition. Workers at the Agricultural Experiment Station of Cornell University, Ithaca, N. Y., have demonstrated that highly unsaturated lipids increase the food value to poultry of saturated fats like tallow by means of a synergistic interaction. (Menhaden oil is a highly unsaturated lipid.)

* * * * *

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January 1964: Based on domestic production and imports, the United States available supply of fish meal for January 1964 amounted to 32,813 short tons--12,033 tons (or 57.9 percent) more than during January 1963. Domestic production was 447 tons (or 19.6 percent) less, but imports were 12,480 tons (or 67.5 percent) higher than in January 1963. Peru continued to lead other countries with shipments of 25,090 tons.

| Item | January | | Total 1963 |
|---|------------------------|---------------|----------------|
| | 1/1964 | 1963 | |
| |(Short Tons)..... | | |
| Fish Meal and Scrap: | | | |
| Domestic production: | | | |
| Menhaden | 2/ | - | 179,971 |
| Tuna and mackerel | 1,124 | 1,708 | 21,626 |
| Herring | 2/ | 2/ | 7,425 |
| Other | 714 | 577 | 32,624 |
| Total production | 1,838 | 2,285 | 241,646 |
| Imports: | | | |
| Canada | 4,150 | 2,905 | 50,925 |
| Peru | 25,090 | 12,672 | 291,544 |
| Chile | - | 2,918 | 24,249 |
| Norway | - | - | 1,819 |
| So. Africa Republic | 1,528 | - | 12,296 |
| Other countries | 207 | - | 2,274 |
| Total imports | 30,975 | 18,495 | 383,107 |
| Available fish meal supply | 32,813 | 20,780 | 624,753 |
| Fish Solubles: | | | |
| Domestic production 2/ | 1,135 | 1,422 | 96,224 |

(Table continued on next column.)

| Product | January | | Total |
|---|--------------------------|--------------|----------------|
| | 1/1964 | 1963 | 1963 |
| | (Short Tons) | | |
| Imports: | | | |
| Canada | 85 | 148 | 2,034 |
| Iceland | - | - | 55 |
| So. Africa Republic | 109 | - | 411 |
| Other countries | 164 | - | 4,273 |
| Total imports | 358 | 148 | 6,773 |
| Available fish solubles supply | 1,493 | 1,570 | 102,997 |
| 1/Preliminary. 2/Included with "other." 3/50-percent solids. Includes production of homogenized condensed fish. | | | |

The United States supply of fish solubles (including homogenized fish) during January 1964 amounted to 1,493 tons--a decrease of 4.9 percent as compared with the same month in 1963.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, February 1964: Preliminary data on U. S. production of fish meal, oil, and solubles for February 1964 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

| Area | Meal | Oil | Solubles | Homogenized ^{3/} |
|---|--------------|--------------|--------------------------|---------------------------|
| | Short Tons | 1,000 Pounds | (Short Tons) | |
| February 1964: | | | | |
| East & Gulf Coasts. | 560 | 651 | 4/ | - |
| West Coast ^{2/} | 1,546 | 1,330 | 4/ | - |
| Total | 2,106 | 1,981 | 813 | - |
| Jan.-Feb. 1964 | | | | |
| Total | 3,944 | 2,689 | 1,948 | - |
| Jan.-Feb. 1963 | | | | |
| Total | 5,132 | 748 | 2,614 | 50 |
| 1/Does not include crab meal, shrimp meal, and liver oils. 2/Includes Hawaii, American Samoa, and Puerto Rico. 3/Includes condensed fish. 4/Includes East, Gulf, and Pacific Coasts. Note: Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon. | | | | |

* * * * *

Production, January 1964: During January 1964, a total of 1,838 tons of fish meal and scrap and 708,000 pounds of marine animal oil was produced in the United States. Compared with January 1963 this was a decrease of 447 tons in meal production and 284,000 pounds in oil production.

The quantity of fish solubles manufactured in January 1964 amounted to 1,135 tons--237 tons less than in January 1963.

Production of tuna and mackerel meal amounted to 1,124 tons which accounted for 61 percent of the January production. Oil from tuna and mackerel (456,000 pounds) comprised 64 percent of the January oil production.

A total of 30,975 tons of fish meal was imported during January 1964--an increase of 67 percent as compared with January 1963.

| Product | January | | Total |
|--|------------------------|--------------|----------------|
| | 1/1964 | 1963 | 1963 |
| | ... (Short Tons) ... | | |
| Fish Meal and Scrap: | | | |
| Herring | 2/ | 2/ | 7,425 |
| Menhaden ³ / | 2/ | - | 179,971 |
| Sardine, Pacific | 1 | 6 | 27 |
| Tuna and mackerel | 1,124 | 1,708 | 21,626 |
| Unclassified | 713 | 571 | 20,597 |
| Total | 1,838 | 2,285 | 229,646 |
| Shellfish, marine-animal meal and scrap | | | |
| | 4/ | 4/ | 12,000 |
| Grand total meal and scrap | 4/ | 4/ | 241,646 |
| Fish solubles: | | | |
| Menhaden | 2/ | - | 73,970 |
| Other | 1,135 | 1,372 | 15,030 |
| Total | 1,135 | 1,372 | 89,000 |
| Homogenized condensed fish | | | |
| | - | 50 | 7,224 |
| | ... (1,000 Pounds) ... | | |
| Oil, body: | | | |
| Herring | 2/ | 2/ | 5,726 |
| Menhaden ³ / | 2/ | - | 165,037 |
| Sardine, Pacific | - | - | 4 |
| Tuna and mackerel | 456 | 290 | 5,654 |
| Other (including whale) | 252 | 134 | 7,588 |
| Total oil | 708 | 424 | 184,009 |

¹/Preliminary data.
²/Included with unclassified.
³/Includes a small quantity of thread herring.
⁴/Not available on a monthly basis.
 Note: Beginning with February 1963 fish oil is shown in pounds instead of gallons.
 Conversion factor, 7.75 pounds equal 1 gallon.



Mississippi

SHRIMP CATCH FROM MISSISSIPPI SOUND ANALYZED:

The Mississippi State Gulf Coast Research Laboratory is sampling and studying postlarval shrimp in Mississippi Sound. The research is being done under contract for the U. S. Bureau of Commercial Fisheries. All postlarval shrimp taken from Mississippi Sound during inshore sampling in November

| Classification | Composition Species of Shrimp | | |
|--|-------------------------------|-------|------|
| | Brown | White | Pink |
| | ... (Percent) ... | | |
| Postlarvae from shrimp sampling, Nov. 1962-Oct. 1963 | 61.3 | 32.3 | 6.3 |
| Commercial catch, 1962 | 61.0 | 31.9 | 6.9 |

Note: The percentage breakdowns by species do not add to 100 percent.

1962-October 1963 have been identified. The samples included 37,250 penaeid shrimp belonging to the 3 commercial species. Of those, 5,257 were juvenile. Catch composition data for the 1962 commercial catch in Mississippi Sound were also obtained.

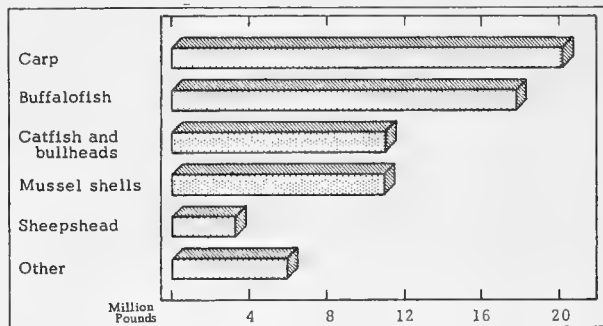
The postlarval shrimp study in Mississippi Sound will continue through November 1964. (Gulf Coast Research Laboratory, March 6, 1964.)



Mississippi River Fisheries

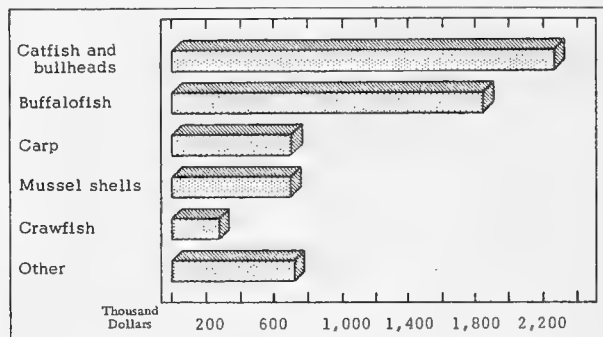
FISHERY LANDINGS, 1962:

Commercial landings of fish and shellfish in the Mississippi River drainage area in 1962 amounted to 69.4 million pounds with a landed value of \$6.5 million--down 8.7 percent in quantity and 6.8 percent in value as compared with the 1961 landings.



Mississippi River catch, 1962.

The four leading species were carp (20.3 million pounds), buffalofish (17.8 million), catfish and bullheads (11.1 million), sheepshead (3.3 million). Those four species with a combined value of a little more than \$5.0 million, accounted for about 95 percent of the total finfish landings of 55.8 million pounds.



Value of Mississippi River catch, 1962.

Mississippi River shellfish production in 1962 totaled 13.6 million pounds valued at \$1.1 million. Mussel shell production of 11.0 million pounds with a value of \$708,000 made up about 80 percent of the shellfish total. Crawfish landings followed with 2.3 million pounds valued at \$272,000. (Mississippi River Fisheries--1962, C. F. S. No. 3408.)



Missouri

COMMERCIAL FISHERIES CATCH IN 1963:

Commercial fishermen took nearly 180 tons of fish in 1963 from the 3 rivers and 1 lake where commercial fishing was permitted in Missouri.

Lake Wappapello, open in 1963 for its first full year of commercial fishing, produced 75,800 pounds of fish, including 54,979 pounds of buffalofish, 17,577 pounds of carp, 651 pounds of drum, 2,274 pounds of gar, and occasional other species.

Carp was the leading species on the rivers, with buffalofish, drum, and catfish also making up large portions of the catch. The commercial harvest in the rivers was 89,397 pounds in the Missouri, 189,571 pounds in the Mississippi, and 4,439 pounds in the St. Francis. (Missouri Conservation Commission, March 16, 1964.)



National Fisheries Center and Aquarium

VARIETY OF AQUATIC SPECIMENS TO BE DONATED:

A contribution from Spain of living specimens of Mediterranean cuttlefish to the National Fisheries Center and Aquarium to be built in Washington, D. C., was announced this past March by the U. S. Department of the Interior. The donation was offered by the Director of Fisheries of the Spanish Inland Fish and Game Service and will be the first of its kind ever exhibited in the United States.

The cuttlefish is related to the octopus and squid and has been well known from an-

cient times as a producer of dark brown sepia, a favorite writing and illustrating medium of Japanese artists for centuries. Although the cuttlefish is considered an edible species in Europe and is in favor with a specialized trade in some parts of the United States, its main value today is for the production of cuttlebone which is used in bird cages for canaries to sharpen their beaks. The "bone" is enclosed by the skin of the animal's back and actually constitutes what remains of the mollusk shell originally worn by its ancestors.

The Acting Director of the Center said it is expected that aquariums throughout the United States and the world will contribute specimens of aquatic life to the \$10 million research and education facility to be built in Washington, D. C. "There are good indications that Japan will provide some of the colorful fish that abound in the Japanese Archipelago," he said. "One of these is the red tai, an important food fish and a relative of the porgy. This species is striking because of its bright red color."

The Center's Acting Director said one of the important contributors will be the Steinhart Aquarium in San Francisco. The curator for Steinhart said his aquarium will donate Pacific moray eels, swell sharks and leopard sharks, and the giant Pacific octopus--the world's largest species. The Pacific octopus reaches a spread of up to 15 feet and a weight of 120 pounds. Other aquariums in the United States are expected to contribute such specimens as piranha, rays, sharks and dolphins.

A survey has shown that the dolphin--popularly known as a porpoise--is the favorite of aquarium visitors because of its high intelligence, according to the Center's Acting Director. In second place are the sea horse and the more ominous creatures such as the octopus, shark, piranha, electric eels, moray eels, and the sting ray. "These animals have a special fascination," he said. "People are especially curious about things they believe are dangerous, but the reputation of some of the creatures is not fully deserved."

The octopus, for example, has an ancient reputation for being the terror of the deep but in reality it is a comparably mild animal. The reputation persists only because the octopus appears ferocious. The octopus, however, could be extremely dangerous because it has all the equipment, including a poisonous

bite that paralyzes fish. But in its natural habitat, the octopus is skittish as far as man is concerned. In captivity, it loses its fear of man and at times becomes almost tame. Coming into contact with the octopus is more likely to be injurious to the marine animal than a man, it is said. "It isn't difficult to pull away from its suction cups," the Acting Director said. "If you do it too quickly, you might tear off the horny cap the octopus has over each suction."

Another species seen in many aquariums is the piranha. The piranha is not spectacular in size or design, but the paradox of its reputation and mild appearance give that South American fish a special attraction. The piranha is said to be especially dangerous near Indian villages where garbage is thrown in the rivers. The piranha learns to associate a splash with food. In more remote areas, however, the piranha is not likely to attack a swimmer unless it smells blood.

The specimen most sought by all aquariums, and one which the Washington, D. C., Fisheries Center hopes to obtain, is the coelacanth, or "living fossil" fish. Fossils of the coelacanth are found in strata of the Middle Devonian Era, which began about 325 million years ago. It occurred first as a fresh-water fish but later showed up as a marine fish in the Triassic Era, beginning about 190 million years ago. Then none were found, and it was believed the coelacanth had been extinct for at least 100 million years.

The first scientific awareness that the coelacanth was still living occurred in 1938 when one was caught in a trawl off the southeastern coast of Africa. The fish measured about five feet in length and was taken from a depth of about 250 feet. The Center's Acting Director said a few coelacanth were caught in the 1950's in the same area but none remained alive for more than several hours. He said the coelacanth is a true fish, but in the evolutionary tree it is close to where amphibians such as the salamander branched off. He noted that the paired pectoral fins of fish, which become shoulders and arms in evolution, and the pelvic fins, which become hind legs, are in the advance stages of becoming limb-like in the coelacanth. "Finding that fish alive is like finding a living dinosaur," he said.

The Fisheries Center at Washington, D. C., plans to have 1,300 kinds of aquatic life--one

of the largest collections in the world. It is expected that many will be donated and the remainder will be purchased. There are some species of aquatic life that it will not be practical to keep at the Center. They include the barracuda, which despite its viciousness is too delicate and nervous to withstand captivity. In confinement, it continually smashes into the sides of its tank and dies of the injuries. The manta ray, which reaches a spread of 22 feet, requires too much area for swimming. Also, it depends on plankton for food, and aquariums cannot supply the microscopic animals and plants in sufficient amounts.

Other species ruled out are those from the deepest parts of the ocean because such fish live in an area of great pressure. When they are brought to the surface they suffer from decompression and usually die. The release of pressure causes small air bubbles to form and block blood vessels. The Fisheries Center plans to display models of the deep ocean fish in a simulated habitat called "Creatures of the Abyssal Depths."

The Center is to be constructed on a 20-acre site at Hains Point in East Potomac Park in Washington, D. C., and is expected to attract 3 million visitors a year. Completion is expected about 1967.

Note: See Commercial Fisheries Review, April 1964 p. 22, October 1963 p. 28, July 1963 p. 45.

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ARCHITECTS SELECTED TO DRAW PLANS:

The selection of two architectural firms to jointly prepare plans for the National Fisheries Center and Aquarium in Washington, D. C., was announced on March 10, 1964, by General Services Administrator Bernard L. Boutin and Secretary of the Interior Stewart L. Udall.

The firms awarded the contract for the plans are in Los Angeles, Calif., and Madison, Wis. Completion of preliminary drawings and alternate design concepts was expected to take about three months. An estimated 20 months will be required to complete final working drawings.

The U. S. Department of the Interior's proposed 1964/65 fiscal year budget provides \$500,000 for the preparation of final plans. Financing arrangements for the \$10 million

Center are unique in that they provide that the Government research and educational institution will be self-supporting. Both construction and operation costs are to be paid from an admission charge to all except student groups.

The Center will show one of the world's largest collections of aquatic animals in near natural habitat. There will be extensive research facilities for such studies as genetics, reproduction, nutrition, fish diseases, antibiotics produced by marine animals, and experimental ecology.

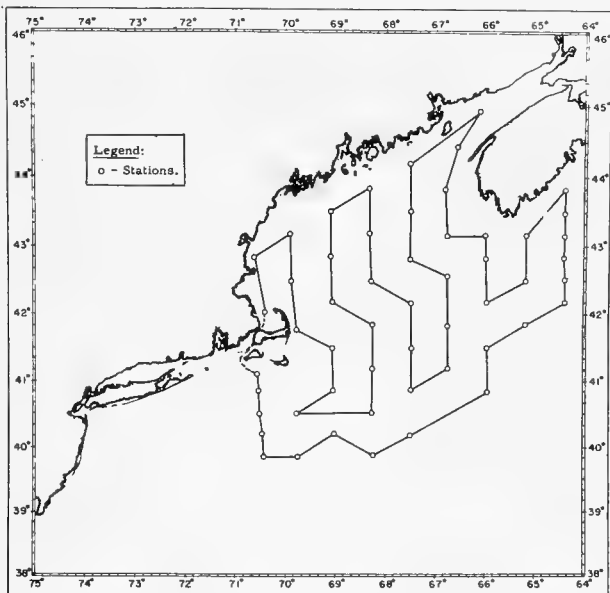
The National Fisheries Center will be administered by Interior's Bureau of Sport Fisheries and Wildlife.



North Atlantic Fisheries Investigations

HYDROGRAPHIC-PLANKTON SURVEY IN THE GULF OF MAINE:

M/V "Albatross IV" Cruise 64-2 (February 24-March 7, 1964): To collect data on hydrographic conditions and zooplankton distribution and abundance over the Continental Shelf in the Gulf of Maine area of the North Atlantic were the main objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.



Albatross IV Cruise 64-2 (February 24-March 7, 1964): Vessel track and hydrographic-plankton stations.

Planned observations were completed at 53 of the 54 plankton-hydrographic stations scheduled. At each station, samples for temperature, oxygen, salinity, chlorophyll, and zooplankton were taken. A total of 98 bathythermograph observations were made, and 265 drift bottles and 265 sea-bed drifters were released.

Two oblique tows with a midwater trawl were made in deep water off the edge of the Continental Shelf. The Myctophidae taken in those tows was forwarded to a scientist associated with the British Museum.

At the start of the cruise, an attempt was made to secure live haddock for blood samples and aquarium specimens, but the operation was hampered by poor weather conditions.



Oceanography

EDUCATIONAL GRANTS FOR 1964 AWARDED BY INTERIOR DEPARTMENT:

Graduate educational grants to 17 universities as part of the National Oceanographic Program were awarded by the U. S. Department of the Interior, Secretary Udall announced on March 11, 1964.

The universities awarded those grants will select outstanding student scientists, who have been graduated or are about to be graduated to receive 1- or 2-year grants. The awards will be available at the beginning of the 1964 fall semester. Grants will be for study in the fields of economics, fishery technology, taxonomy (science of classification), physical and chemical oceanography, marine biology, and fishery biology.

The 1964 awards by Interior will support 20 new student recipients. Part of the funds also may be used to continue the training of seven students already participating in the study program. Grants provide for payment of tuition fees and a living expense allowance of \$3,000 a year. Married students with children receive an additional \$1,000 family allowance. At the close of the academic year, each student's progress is reviewed before a second-year grant is approved.

Secretary Udall said the program began in 1962, following Congressional action, to

assist in developing scientists in fishery oceanography. It is administered by Interior's Bureau of Commercial Fisheries, which makes \$200,000 available each year for the study program. Selection of institutions to receive the grants is made by the Department of the Interior with the advice of a panel representing leading universities and research institutions. All qualified institutions are invited to participate in the program. Grants were made to 17 universities in 1963 and to 12 in 1962.

Student applications for grants are made directly to the university of their choice. The actual number of participating students will depend upon decisions by the universities in selecting students for one or two-year participation.

Universities to receive the 1964 grants and fields of study are:

University of California at Berkeley, fishery technology; University of California at San Diego (Scripps Institution of Oceanography), oceanography and marine biology; Columbia University (Lamont Geological Observatory), oceanography; Cornell University, taxonomy; Duke University, marine biology; University of Hawaii, marine biology; Iowa State University, fishery biology; The Johns Hopkins University, oceanography; Massachusetts Institute of Technology, oceanography and fishery technology; University of Miami (Institute of Marine Science), fishery biology and taxonomy; University of Michigan, fishery biology and taxonomy; North Dakota State University, fishery technology; Oregon State University, oceanography and fishery technology; University of Rhode Island, marine biology or oceanography; University of Virginia (Virginia Institute of Marine Science), marine biology; University of Washington, fishery economics, oceanography, and fishery biology; and University of Wisconsin, fishery biology.

Note: See Commercial Fisheries Review, May 1963 p. 34.



Oysters

HARVEST IN SPRING MONTHS SUGGESTED:

The belief that oysters are good to eat only during months that have an "R" is a myth, according to biologists of the U. S. Bu-



Maryland pan fried oysters (see p. 11 for recipe).

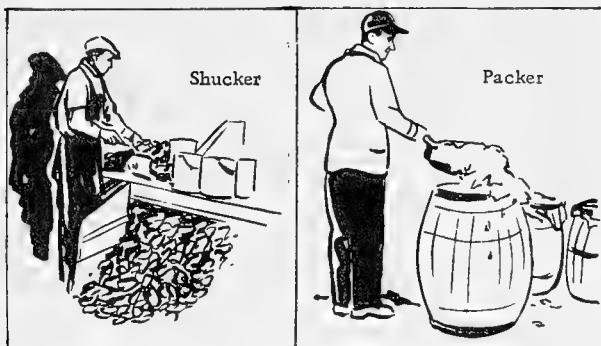
reau of Commercial Fisheries. Oysters usually reach their peak of perfection in May and June--months that have no "R" in them. Oysters are fatter and taste better in the spring because at that time they begin to store glycogen, and animal starch, in preparation for the spawning season in summer.

During summer and early fall, oysters become thinner, their nectar becomes comparatively watery, and their flavor declines. The fattening cycle usually does not resume until October or November. The harvest of oysters, however, usually begins in September or October--a time when oysters generally are not at their best.

Several reasons for the conflict between harvesting and natural growth were explained by the Bureau of Commercial Fisheries' Assistant Director for Biological Research. The oyster harvest is begun in early fall because the demand is seasonal and the prices are highest at that time. The seasonal demand may have been caused by the "R-month" myth. Another reason is that most oysters are marketed in the raw shucked state and, in the early

days, storage life probably was longer in cooler weather. Some of the origins of the "R-month" myth may have been lost in history, but one of the apparent origins is the spawning methods of the European oyster. That oyster is unique in that its young are retained by the mother until tiny shells are developed. The presence of the small gritty shells makes the European oyster undesirable for human food during the non "R-months."

Changing the oyster harvest time in the United States to late spring could result in important economic benefits to the oyster in-



dustry. Oyster mortalities usually are heaviest in summer, and losses of 25 to 50 percent are not uncommon. Thus, an earlier harvest could result in obtaining many more bushels of oysters in a given area. Further, because oysters are fatter in the spring, there would be a much greater yield of meats in each bushel harvested.

The tradition of the fall harvest is unlikely to change, however, until enough consumers become aware that the "R-month" rule is a myth and start asking for oysters in spring months.



Pollution

CONFERENCE ON MILFOIL CONTROL:

A conference on the Eurasian water milfoil problem was held early in 1964 in Annapolis, Md. The meeting (the Fifth Annual Workshop) was attended by about 60 specialists, including officials of state and Federal agencies, universities, and the chemical industry. The prolific growth of milfoil (an aquatic plant) is causing problems in Chesapeake Bay and other areas.

The chairman of the meeting stressed that realistic estimates must be made of the present and potential threat by milfoil to recreational use of water, to real estate values, to shellfish, and to wildfowl feeding areas. Careful attention must also be given to any possible dangers resulting from the use of chemicals in controlling milfoil. All of those estimates are necessary in reaching wise decisions on control.

The problems associated with milfoil were further outlined in a speech by the Director of the Natural Resources Institute of the University of Maryland. He traced the rapid growth of water milfoil in the upper Chesapeake Bay since 1959, its wide distribution, and the present threat to Chesapeake Bay resources. He cited the substantial success which has been achieved in the development of chemical methods which can control milfoil in local areas. But he also mentioned the need for additional information on chemical methods of control. Precise methods for detecting herbicide residues are needed. A better understanding of the biological effects of chemicals on marine life, wildlife, and plants is needed, and specific information should be developed to guide those state agencies which must set regulations.

It was reported that new areas were invaded by milfoil in 1963, including the Patuxent River in Maryland, additional areas in Virginia, parts of the Tennessee Valley, and other locations. Tidal waters have been found to pose exceptional difficulties in control.

Maryland state officials have established a procedure for considering requests to use certain herbicides in Maryland waters. The procedure will apply to the requests of individuals or groups who wish to control water milfoil in late May or June (the only time it is susceptible). The Maryland Department of Tidewater Fisheries will handle requests affecting tidal water, and the Maryland Game and Inland Fish Commission will handle requests affecting fresh water areas. Both agencies will work closely with the Maryland Health Department and Water Pollution Control Commission in reviewing requests.

Looking to the future, biologists reported that certain insects present on milfoil in Pakistan, and a plant-eating fish from Japan, called the "sogyo," are under study as possible aids in control.

Specialists described plans for chemical control of 750 acres of water in the Tennessee Valley. Scientists also discussed plans to screen and test new herbicides, and plans for a thorough study of any direct or indirect toxic effects on plants and animals.

Current Federal legislation which might assist in future efforts to control milfoil was summarized by the U. S. Army Corps of Engineers. (Natural Resources Institute, University of Maryland, February 24, 1964.)



Salmon

NEW FISH FARM IN WASHINGTON STATE ESTABLISHED BY COOPERATIVE EFFORT:

A new salmon fish farm in Washington State will start production in 1964 through the joint efforts of a sport fishermen's club, land owners, and the Washington State Department of Fisheries. The new natural production area is Campbell Slough in the Hump-tulips River Delta about nine miles northwest of Hoquiam, Wash. The slough comprises approximately 10 acres of water area which drains into North Bay.

A land owner in the area built a dike and installed a tide gate near the outlet of the slough to reclaim the area as a fresh-water lake. The Fisheries Department surveyed the slough, and took water samples for analysis to determine the site's potential for salmon production. The results were favorable. Water quality is such that chinook fingerlings can be raised to migrant size without a feeding program. After scrap fish are removed from the slough by rotenone treatment, chinook salmon will be planted.

A sport fishermen's club in Grays Harbor will purchase all the material necessary for a permanent fish-rearing installation, and the State Fisheries Department will complete the project, thus Washington will gain a new fish farm through the multiple efforts of the sportsmen, land owners, and the Fisheries Department.

Adult salmon returning to the new fish farm will contribute to the commercial and sport fisheries offshore, at Westport and Grays Harbor. (Washington State Department of Fisheries, February 28, 1964.)

Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, FEBRUARY 1964:

| Item and Period | 1964 | 1963 | 1962 | 1961 | 1960 |
|---|---------|---------|---------|---------|---------|
| (1,000 Lbs., Heads-Off) | | | | | |
| Total landings, So. Atl. and Gulf States: | | | | | |
| April | - | 4,427 | 3,358 | 3,171 | 4,728 |
| March | - | 3,632 | 3,331 | 4,754 | 4,099 |
| February | 4,000 | 3,986 | 4,123 | 3,910 | 3,784 |
| January | 6,160 | 3,993 | 3,840 | 5,686 | 5,402 |
| December | - | 9,409 | 8,615 | 6,538 | 7,099 |
| January-December | - | 138,187 | 105,839 | 91,396 | 141,035 |
| Quantity canned, Gulf States 1/: | | | | | |
| April | - | 105 | 12 | 9 | 66 |
| March | - | 92 | 86 | 35 | 117 |
| February | 309 | 281 | 241 | 90 | 204 |
| January | 359 | 592 | 492 | 183 | 266 |
| December | - | 2,175 | 1,879 | 816 | 894 |
| January-December | - | 29,468 | 23,322 | 14,500 | 26,394 |
| Frozen inventories (as of end of each mo., 2/: | | | | | |
| April 30 | - | 24,954 | 15,637 | 27,492 | 20,502 |
| March 31 | - | 27,970 | 16,607 | 31,345 | 23,232 |
| February 29 | - | 28,039 | 19,012 | 37,612 | 29,063 |
| January 31 | 43,896 | 28,487 | 21,328 | 37,842 | 34,332 |
| December 31 | - | 45,764 | 31,577 | 19,755 | 40,913 |
| Imports 3/: | | | | | |
| April | - | 11,082 | 10,210 | 9,208 | 7,733 |
| March | - | 13,616 | 9,658 | 10,347 | 8,545 |
| February | - | 12,100 | 10,599 | 8,932 | 7,657 |
| January | 13,272 | 13,139 | 12,907 | 12,338 | 8,596 |
| December | - | 16,296 | 15,798 | 15,442 | 12,411 |
| January-December | - | 151,530 | 141,183 | 126,268 | 113,418 |
| ... (¢/lb., 26-30 Count, Heads-Off) . . | | | | | |
| Ex-vessel price, all species, So. Atl. and Gulf Ports: | | | | | |
| April | - | 83.6 | 82.2 | 55.4 | 60.6 |
| March | - | 85.5 | 80.9 | 56.0 | 56.3 |
| February | 4/57-65 | 85.7 | 78.9 | 53.5 | 51.8 |
| January | 4/57-69 | 85.0 | 76.3 | 52.5 | 49.5 |
| December | - | 59.6 | 82.9 | 75.2 | 54.2 |
| November | - | 52.3 | 84.5 | 73.5 | 54.0 |
| October | - | 53.3 | 90.0 | 68.7 | 53.0 |
| September | - | 57.9 | 90.9 | 70.1 | 52.2 |
| Wholesale price, froz. brown (5-lb. pkg.) Chicago, Ill.: | | | | | |
| April | - | 100-105 | 94-97 | 69-70 | 74-75 |
| March | - | 102-106 | 94-95 | 69-71 | 65-68 |
| February | 73-82 | 102-106 | 93-95 | 69-71 | 65-67 |
| January | 78-83 | 102-106 | 91-94 | 69-71 | 64-66 |
| December | - | 75-83 | 101-107 | 91-92 | 68-70 |
| November | - | 71-78 | 105-110 | 89-92 | 69-73 |
| October | - | 67-75 | 108-115 | 83-90 | 69-73 |
| September | - | 73-77 | 113-118 | 87-90 | 65-70 |

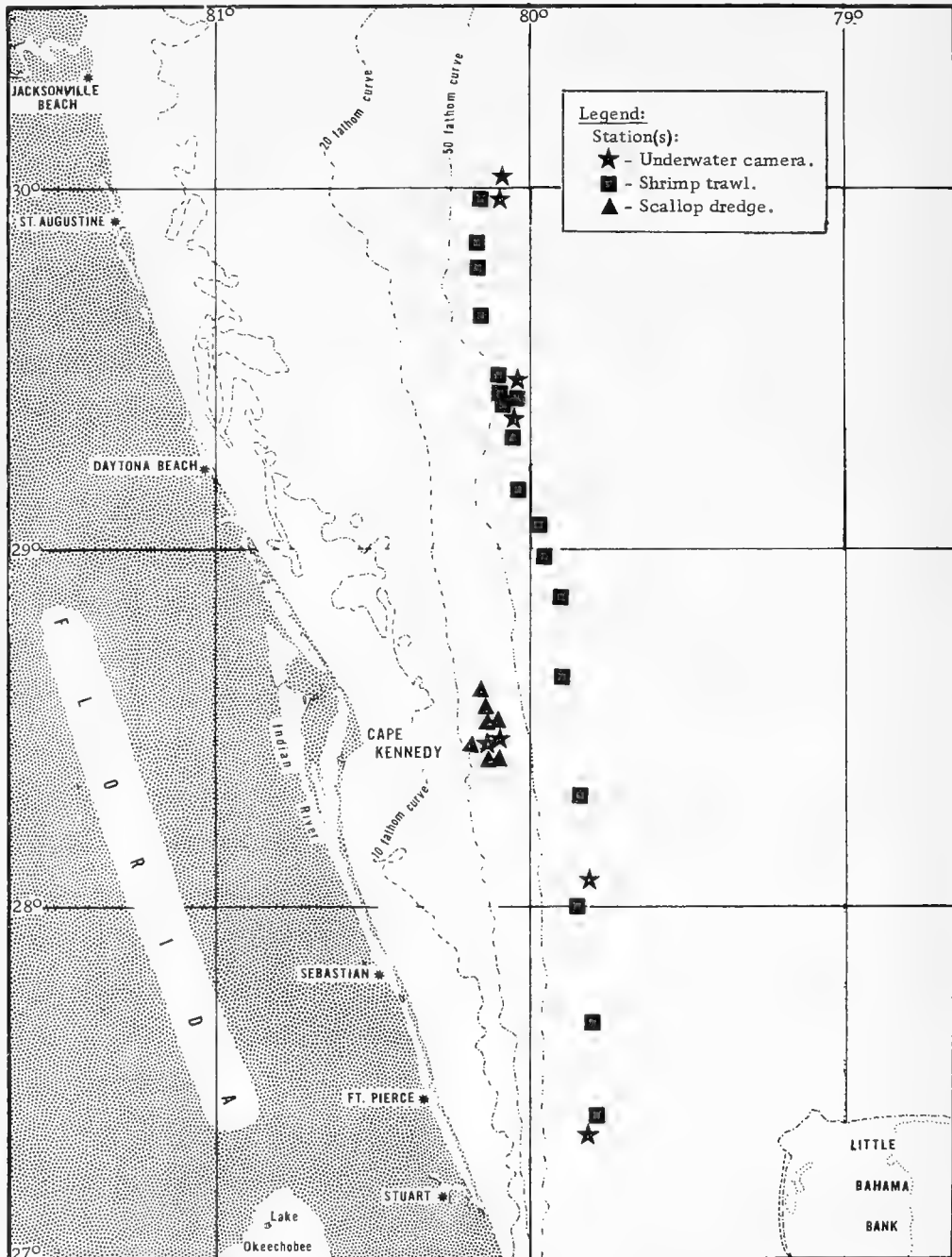
1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3.
 2/Raw headless only; excludes breaded, peeled and deveined, etc.
 3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
 4/Range in prices at Tampa, Fla.; Morgan City, La.; area; Port Isabel and Brownsville, Texas only.
 Note: February 1963 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.



South Atlantic Exploratory Fishery Program

ROYAL-RED SHRIMP AND CALICO
SCALLOP GROUNDS PHOTOGRAPHED:
M/V "Silver Bay" Cruise 54 (February
4-16, 1964): To obtain bottom photographs

in the center of the royal-red shrimp range (200 fathoms) off Florida's east coast was the main objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay. For this purpose an underwater camera was used at 8 stations extending from St. Augustine southward to below Fort Pierce.



Shows the station pattern of M/V Silver Bay Cruise 54, February 4-16, 1964.

A total of 500 feet of 35 millimeter black and white film was exposed in royal-red shrimp depths with a self-contained still camera equipped with electronic flash. Attempts to obtain 16 millimeter motion picture footage were unsuccessful because of heavy seas. An additional 200 feet of 35 millimeter black and white film was exposed on bottom on the calico scallop grounds (26½ fathoms) off Cape Kennedy. Development of test film strips aboard the vessel showed that good photographs were obtained in both depth ranges.

In depths of from 160 to 225 fathoms, 18 shrimp trawl drags yielded small catches of royal-red shrimp, ranging up to 70 pounds (21 to 46 heads-on count) for each 3-hour drag. An unusually low bottom temperature of 46° F. was obtained in 225 fathoms east of Daytona Beach.

Catches of calico scallops on this cruise ranged from a few individuals to 4 bushels for each drag. These were made in eight 30-minute drags using a 6-foot tumbler dredge in the 25 to 28 fathoms depth range off Cape Kennedy. The scallop meats were in fair condition and averaged 105 count to the pound.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JANUARY-MARCH 1964:

A report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for January-March 1964, follows:

Oyster Studies: Experiments were continued on the supplemental feeding of oysters during this period. Again the studies indicate that oysters maintained in 12 x 12 foot concrete tanks, when fed with cracked rice, gain 3.5 percent in underwater weight in a month when compared with oysters of similar size and weight used as controls and unfed. This was true for controls both in the experimental tanks and in trays suspended under the Laboratory docks on We Creek.

Shrimp Studies: Catch-per-unit-of effort data in experimental trawling throughout coastal waters during January-March 1964 indicated that most commercial species of

marine organisms were less abundant than during the same periods in 1963 and 1962.

| Year | Spot | Croaker | White Shrimp | Blue Crabs | |
|------|------|---------|--------------|------------|----------|
| | | | | Mature | Immature |
| 1964 | 0.7 | 9.5 | -0.1 | 3.2 | 9.4 |
| 1963 | 7.9 | 10.2 | 3.2 | 8.1 | 8.6 |
| 1962 | 22.1 | 18.6 | 26.3 | 14.1 | 23.9 |

As can be seen in the table, a continual decline in the abundance of the species listed, with the exception of immature blue crabs, has taken place since 1962. White shrimp were almost nonexistent in experimental trawling during the first 3 months of 1964, and only two specimens were found in more than 75 standard trawl drags. It is apparent from this that very few white shrimp wintered-over in coastal waters.

Spot and mature blue crabs also showed considerable declines in numbers during January-March of 1964 as compared with the same quarters in 1963 and 1962. Croakers, while only slightly less numerous at stations during the 1964 quarter as compared with that of 1963, nonetheless showed a general pattern of decreased abundance for the three year period.

The reasons for the decline in abundance of commercial species during January-March over the past three years are not known at present. One possibility is that a very slight decline in average water temperature along the coast is responsible for the changes noted, although no such changes have been observed in the course of shrimp survey studies. It is possible that these changes, however, have been so gradual and slight as to escape detection by ordinary methods. It has been observed that spiny dogfish (*Squalus acanthias*), a small species of shark ordinarily found in colder northern waters, has become increasingly abundant in coastal waters during the past three years, and this may give some indication that water temperatures are playing a part in the changes which have taken place during that period.

Plankton Studies: Experimental plankton collections were made from Little River, south of Calibogue Sound, during January-March of this year. Postlarval brown shrimp began to appear in plankton samples in early February 1964, but reached no significant abundance until late February and early March. To date the postlarvae have been

slightly less abundant at plankton stations located from Charleston Harbor south to Calibogue Sound, S. C., than during the same period of 1963. Recruitment of those post-larvae at stations located north of Charleston Harbor has been greater than to the south, and through March of this year has been slightly improved over that of 1963.

On the whole, the outlook for brown shrimp in 1964 appears about the same, if perhaps even less promising, as the outlook in 1963 was at the end of the first quarter.

Larval and postlarval spot, menhaden, and flounder showed normal or above normal recruitment in coastal waters January-March 1964. Phenomenal numbers of postlarval menhaden were observed in Breach Inlet and Little River Inlet during February and March of this year. Apparently successful offshore spawning of spot and menhaden, as well as flounder, took place in December and January resulting in the unusual abundance of these fishes in plankton collections.

Pond Cultivation: The major ponds at the Laboratory are being prepared to begin further experiments on the cultivation of shrimp in ponds. The flood gates to the 1-acre "Fish Pond" have been adjusted to allow a flow of about 1½-acre feet of water in and out of the pond on each tide. When the flood gates are thus adjusted about 18 inches of water remains in the pond at all times. Post-larval brown shrimp (*Penaeus aztecus*) made their appearance in We Creek, which waters feed the ponds, beginning on March 9. The flood gates were to remain open until the first part of April in an attempt to trap a sizable population of postlarval shrimp in the pond for "pasturing" and growth.

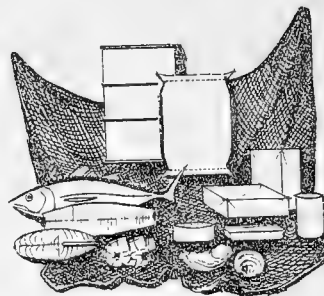


United States Fisheries

MORE FISHERY PRODUCTS USED IN UNITED STATES IN 1963:

A record 11.2 billion pounds of fishery products were landed and imported in the United States in 1963 as compared with the previous high of 10.4 billion pounds in 1962. Some 6.7 billion pounds of fish was converted into industrial fishery products, with the remainder used for human food.

The increased supply of fishery products in the United States in 1963 was due to a gain of more than 1.5 billion pounds which was used for industrial products--mostly fish meal. But the United States per capita consumption of edible fishery products for the year dropped about one-tenth of a pound from 1962. Plentiful supplies of poultry and beef at relatively low prices were believed responsible for the lower consumption of fishery products.



For the first time, imports accounted for more than half of the total supply of fishery products in the United States. Landings by domestic fishermen in 1963 provided only about 42 percent of the total as compared with 52 percent in 1962. United States fishery landings of 4.75 billion pounds during the year with an ex-vessel value of \$378 million provided about 55 percent of the edible fish supply for the United States and only about 34 percent of the inedible supply were used for industrial products.

Despite a 600-million-pound drop from the previous year in the United States fishery landings, and a decrease in value of \$18 million, the 1963 value was second only to 1962 when it was \$396 million. Most of the decline in landings was due to the lower menhaden catch (down 568 million pounds)--a species used for fish meal and oil. Landings also were lower for salmon, whiting, ocean perch, Pacific mackerel and sardines, haddock, Maine herring, and blue crab. But total United States shrimp landings were up 49 million pounds, 24 million pounds more of king crab were landed, and landings of yellowtail flounder were up 22 million pounds from 1962.

A review of the United States 1963 commercial fishery landings by regions follows:

New England and North Atlantic: There was a large increase in landings of North Atlantic tuna, but groundfish landings such as cod, haddock, and ocean perch, were down. Herring was down because of low demand. Most of the sharply increased yellowtail flounder landings were at New Bedford, Mass. The domestic tuna catch in the North Atlantic was a record breaking 18 million pounds.

Middle Atlantic: Menhaden landings dropped sharply to only 366 million pounds, about 400 million pounds below 1962.

Chesapeake Bay: There was a sharp decline in crabs and menhaden. Croaker and oysters also were down.

South Atlantic: The poorest shrimp landings in years were experienced, but a record was established in the catch of blue crabs. Menhaden landings showed a strong rise.

Gulf of Mexico: Oyster production set a new record, and shrimp landings were the best since 1955. Menhaden and blue crabs were down slightly.

Pacific Coast and Hawaii: There were good landings of albacore tuna, but yellowfin was down, with virtually no change in the over-all quantity of tuna landed. Sardines again failed to appear in quantity off southern California. In Washington, a large pink salmon run brought the total salmon catch to 55 million pounds, compared with 23 million pounds in 1962. The catch of Dungeness crabs was less than normal.

Alaska: King crab production set a record. The salmon catch was down due to smaller runs. Halibut landings were below 1962 but the Dungeness crab catch was up nearly 3 million pounds.

The United States with about 6 percent of the world fishery landings in 1963 remained in fifth place among the world's leading fishing nations. Japan ranked first, followed by Peru, Communist China, and the Soviet Union.



U. S. Foreign Trade

IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-February 29, 1964, amounted to 4,234,009 pounds (about 201,619 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1964 at the 12½-percent rate of duty has not been announced; however, in 1963 the quota was 63,130,642 pounds (or about 3,006,221 standard cases of 48 7-oz. cans). Any imports in excess of that quota would have been dutiable at 25 percent ad valorem.

* * * * *

PROCESSED EDIBLE FISHERY PRODUCTS, JANUARY 1964:

United States imports of processed edible fishery products in January 1964 were up 14.7 percent in quantity and 2.2 percent in value from those in the previous month. In January 1964, there were higher imports of most fish fillet items, fish blocks and slabs, and canned sardines (in oil and not in oil). The increase was partly offset by a sharp drop in arrivals of canned tuna in brine.

Compared with the same month in 1963, imports in January 1964 were up 29.0 percent in quantity and 35.9 percent in value. There was a substantial increase this January in imports of fish blocks and slabs, cod fillets, ocean perch fillets, flounder fillets, sea catfish fillets, yellow pike fillets, canned tuna in brine, canned sardines (in oil and not in oil), and canned oysters. But there was a

U. S. Imports and Exports of Processed Edible Fishery Products, January 1964 with Comparisons

| Item | Quantity | | Value | |
|----------------------------------|---------------------|------|-------------------|------|
| | 1964 | 1963 | 1964 | 1963 |
| | .(Millions of Lbs.) | | .(Millions of \$) | |
| Imports ¹ / | 49.2 | 37.9 | 14.0 | 10.3 |
| Exports ² / | 4.4 | 3.7 | 1.5 | 1.6 |

¹/Includes only those fishery products classified by the U. S. Bureau of the Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i. e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

²/Excludes fresh and frozen.

noticeable decline in imports of haddock fillets.

Exports of processed edible fish and shellfish from the United States in January 1964 were up 2.3 percent in quantity but down 28.6 percent in value from those in the previous month. A sharp increase in exports of the lower-priced canned mackerel was about offset by a decline in shipments of canned squid and the higher-priced canned salmon and canned shrimp.

Compared with the same month in 1963, the exports in January 1964 were up 18.9 percent in quantity but down 6.3 percent in value. This January there were much larger exports of canned mackerel and shipments of canned shrimp were also somewhat higher, but exports were down sharply for canned salmon and canned squid.

Notes: (1) Prior to October 1963, the data shown were included in news releases on "U. S. Imports and Exports of Edible Fishery Products." Before October 1963, data showing "U. S. Imports of Edible Fishery Products" summarized both manufactured and crude products. At present, a monthly summary of U. S. imports of crude or nonprocessed fishery products is not available; therefore, only imports of manufactured or processed fishery products are reported. The import data are, therefore, not comparable to previous reports of "U. S. Imports of Edible Fishery Products."

The export data shown are comparable to previous data in "U. S. Exports of Edible Fishery Products." The export data in this series of articles have always been limited to manufactured or processed products.

(2) See Commercial Fisheries Review, April 1964 p. 37.

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AIRBORNE IMPORTS OF FISHERY PRODUCTS, DECEMBER 1963:

Airborne fishery imports into the United States in December 1963 were up 38.1 percent in quantity and 32.1 percent in value from those in the previous month. The increase was due mainly to greater arrivals of shrimp from Venezuela.

Raw headless shrimp continued to make up the bulk of the airborne shrimp imports--in December 1963, shipments consisted of 702,423 pounds of fresh or frozen raw headless, 12,267 pounds of frozen raw peeled, and 34,996 pounds of unclassified shrimp. About 98 percent of the airborne shrimp arrivals in December entered through the U. S. Customs District of Florida. The remainder entered through the Customs Districts of Laredo (Tex.) and Puerto Rico.

Airborne imports of shellfish other than shrimp in December consisted of 73,777 pounds of fresh or frozen spiny lobster products and 13,660 pounds of scallops, all of which entered through the Customs District of Florida.

Total airborne imports of fishery products in 1963 were about the same as those in 1962, although there were changes in shipments from individual countries. A sharp increase in airborne shipments of shrimp from Venezuela in 1963 was partly offset by a decline in airborne shrimp shipments from Panama, Costa Rica, Nicaragua, El Salvador, and Guatemala. The leading shellfish items other than shrimp imported by air in 1962 and 1963 were live northern lobsters from Canada and fresh and frozen spiny lobster products from Central and South American countries. Airborne shipments of north-

| U. S. ^{1/} Airborne Imports of Fishery Products, January-December 1963 with Comparative Data | | | | | | |
|--|--------------------|---------------------|--------------------|---------------------|--------------------|---------------------|
| Product and Origin ^{2/} | 1963 | | 1963 | | 1962 | |
| | December | | Jan. Dec. | | Jan. Dec. | |
| | Qty. ^{3/} | Value ^{4/} | Qty. ^{3/} | Value ^{4/} | Qty. ^{3/} | Value ^{4/} |
| | 1,000 Lbs. | US\$ 1,000 | 1,000 Lbs. | US\$ 1,000 | 1,000 Lbs. | US\$ 1,000 |
| Fish: | | | | | | |
| Mexico | - | - | 264.8 | 70.0 | 964.5 | 160.3 |
| British Honduras | - | - | 43.5 | 10.7 | 39.8 | 8.7 |
| Honduras | - | - | 16.5 | 4.3 | 2.8 | 0.6 |
| Japan | 5/ | 0.1 | 2.0 | 8.3 | - | - |
| United Kingdom | 1.0 | 1.9 | 4.5 | 9.3 | 0.7 | 1.8 |
| Iran | - | - | 1.2 | 7.4 | 13.9 | 142.9 |
| France | 0.5 | 0.5 | 10.6 | 11.1 | 0.3 | 0.7 |
| Rumania | - | - | - | - | 1.9 | 15.9 |
| Panama | - | - | 0.9 | 0.4 | 7.8 | 1.3 |
| U.S.S.R. | - | - | 26.8 | 70.2 | - | - |
| Canada | 2.2 | 0.9 | 2.2 | 0.9 | 22.1 | 17.6 |
| Costa Rica | - | - | - | - | 5.6 | 0.9 |
| Other countries | - | - | 3.5 | 0.9 | 39.0 | 12.8 |
| Total Fish | 3.7 | 3.4 | 376.5 | 193.5 | 1,098.4 | 363.5 |
| Shrimp: | | | | | | |
| Guatemala | - | - | 141.6 | 74.0 | 321.9 | 164.2 |
| El Salvador | 40.3 | 28.8 | 338.0 | 219.0 | 716.5 | 447.9 |
| Honduras | - | - | 99.8 | 52.3 | 39.8 | 25.2 |
| Nicaragua | 12.3 | 6.7 | 517.3 | 181.3 | 1,008.6 | 343.6 |
| Costa Rica | 46.5 | 24.1 | 644.8 | 308.4 | 819.9 | 370.5 |
| Panama | 91.7 | 58.7 | 1,633.0 | 890.2 | 1,867.1 | 1,055.2 |
| Venezuela | 547.7 | 201.1 | 5,048.2 | 2,297.9 | 3,380.1 | 1,815.3 |
| Ecuador | - | - | 111.6 | 39.4 | 12.2 | 3.4 |
| France | - | - | 2.6 | 0.9 | - | - |
| Mexico | - | - | 13.2 | 6.9 | 24.7 | 9.0 |
| Netherlands Antilles | - | - | - | - | 3.1 | 2.7 |
| Argentina | - | - | - | - | 10.5 | 4.9 |
| British Honduras | - | - | 7.9 | 8.6 | - | - |
| Jamaica | 11.2 | 2.9 | 11.2 | 2.9 | - | - |
| Total Shrimp | 749.7 | 322.3 | 8,569.2 | 4,081.8 | 8,204.4 | 4,241.9 |
| Shellfish other than Shrimp: | | | | | | |
| Mexico | - | - | 101.1 | 60.8 | 94.0 | 61.6 |
| British Honduras | 34.1 | 29.3 | 378.6 | 311.1 | 317.1 | 219.3 |
| El Salvador | - | - | 5.0 | 3.6 | 7.1 | 5.1 |
| Honduras | - | - | 17.0 | 7.0 | 141.5 | 104.5 |
| Nicaragua | 18.7 | 13.3 | 183.2 | 113.3 | 18.7 | 16.2 |
| Costa Rica | - | - | 73.8 | 60.1 | 7.1 | 6.0 |
| Jamaica | 20.1 | 17.1 | 86.6 | 67.3 | 43.3 | 30.2 |
| Netherlands Antilles | - | - | 45.5 | 32.7 | 58.0 | 34.8 |
| Colombia | - | - | 8.0 | 21.7 | 1.8 | 5.1 |
| Ecuador | - | - | 2.2 | 1.8 | 3.7 | 2.1 |
| Tunisia | - | - | 0.8 | 0.9 | - | - |
| Leeward and Wind- ward Islands | - | - | 1.6 | 0.5 | 31.3 | 11.9 |
| British Guiana | - | - | 1.7 | 0.3 | - | - |
| Canada | - | - | 213.3 | 109.2 | 224.1 | 91.1 |
| Venezuela | - | - | 13.7 | 6.0 | 32.3 | 20.3 |
| Panama | 14.1 | 7.1 | 19.1 | 10.9 | 1.0 | 1.0 |
| Guatemala | - | - | - | - | 12.9 | 6.3 |
| Bahamas | - | - | 5.3 | 5.2 | 37.5 | 12.3 |
| Dominican Republic | 0.4 | 0.1 | 25.7 | 23.9 | 33.2 | 28.3 |
| Yugoslavia | - | - | 1.2 | 0.7 | - | - |
| Trinidad | - | - | - | - | 2.3 | 1.0 |
| Other countries | - | - | 2.0 | 2.9 | 8.3 | 12.0 |
| Total Shellfish (ex- cept shrimp) | 87.4 | 66.9 | 1,185.4 | 839.9 | 1,075.2 | 669.1 |
| Grand Total | 840.8 | 392.6 | 10,131.1 | 5,115.2 | 10,378.0 | 5,274.5 |

^{1/}Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.

^{2/}When the country of origin is not known, the country of shipment is shown.

^{3/}Gross weight of shipments, including the weight of containers, wrappings, craters, and moisture content.

^{4/}F. o. b. point of shipment. Does not include U. S. import duties, air freight, or insurance.

^{5/}Less than 50 pounds.

Note: These data are included in the over-all import figures for total imports, i. e., these imports are not to be added to other import data published.

Source: United States Airborne Imports of Merchandise, FT 380, December 1963, U. S. Bureau of the Census.

ern lobsters from Canada in 1963 were similar to those in the previous year. British Honduras was the leading supplier of airborne imports of spiny lobsters in both 1962 and 1963. In 1963, a sharp decline in airborne arrivals of spiny lobsters from Honduras was offset by increased spiny lobster shipments from Nicaragua. Fish fillets from Mexico were the leading finfish product (from a volume standpoint) imported by air in both 1962 and 1963, although the quantity was down

sharply in 1963. The airborne imports in both years included several high-value shipments of caviar.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.



Washington

LANDINGS OF FISH AND SHELLFISH, 1963:

Landings of fish and shellfish in Washington State in 1963 amounted to 147,916,231 pounds valued at \$23,027,000 as compared with landings of 116,519,289 pounds valued at \$19,534,014 in 1962.

Total Washington landings in 1963 included 53.8 million pounds of salmon, highlighted by a catch of 31.1 million pounds of pink salmon. Considering the cycle year of the pink salmon and Adams River sockeye salmon runs, the 1963 total landings (all species) are no better than average and have been exceeded 10 times during the past 28 years.

| Washington Landings of Fish and Shellfish, 1963 ^{1/} | | |
|---|--------------------|-------------------|
| Item | Quantity | Ex-Vessel Value |
| | Pounds | Dollars |
| Food fish: | | |
| Salmon | 53,756,307 | 11,759,000 |
| Bottomfish | 46,668,537 | 2,887,600 |
| Other food fish (including halibut) | 26,283,997 | 5,309,000 |
| Industrial fish | 4,297,094 | 27,000 |
| Shellfish | 16,910,296 | 3,044,400 |
| Total | 147,916,231 | 23,027,000 |

^{1/}Preliminary.

High production was recorded in the commercial net fishery for salmon in the southern area of Puget Sound. However, in the northern areas--Port Susan, Port Gardner, and Skagit-Bellingham-Samish Bays--the chum salmon fishery was a complete failure. Sockeye salmon landings of 7.9 million pounds were good only because United States fishermen were able to catch more than their usual share of the run while Canadian fishermen were tied-up by a labor dispute.

Bottomfish landings of 46.7 million pounds were second only to the record production of 49.0 million pounds in 1945. True cod came back strong in 1963 with landings of 6.2 million pounds. (True cod landings had declined from an average of 12 million pounds between 1954 and 1959, to 2 million and 3 million pounds in 1961 and 1962, respectively.) Ocean

perch landings of 15.5 million pounds were at a record level.

Carp landings were also noteworthy, increasing from a range of 200,000-300,000 pounds in 1957-1960 to 825,000 pounds in 1961, 1.2 million pounds in 1962 and 1963. Carp are taken from Moses Lake, Sprague Lake, and reservoir areas of eastern Washington. Virtually all of the carp catch is exported or reduced to fish meal.

The herring catch in 1963 was about average with landings of 6.9 million pounds for all uses--reduction, bait, and human consumption.

Shellfish landings of 16.9 million in 1963 were close to an all-time low due to a decline in the harvest of oysters, shrimp, and clams. (Washington Department of Fisheries, February 28, 1964.)

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SALMON CATCH BY SPORT FISHERMEN IN 1963:

Washington State sport fishermen enjoyed an estimated record catch of 1,130,308 salmon in 1963, with pink salmon predominating in the catch for the first time. The pink salmon catch of 437,000 fish was far above sport catches of that species in previous years. The sport catch of chinook and silver salmon was also high. The estimated silver salmon sport catch of 428,000 was second only to the record catch in 1957, and the 1963 chinook salmon sport catch of 265,000 was exceeded only in 1956 and 1957.

Fishing effort, which obviously has an important effect on catch, increased in 1963 to a total of 1,467,000 angler trips, a gain of 337,000 trips over the previous high established in 1962. Despite the high fishing intensity, the average catch per fisherman-day was 0.77 salmon, the best return to the sport fisherman since 1957.

In 1963, sport salmon catches out of Westport amounted to 173,791 fish, second only to the catch in 1962. Catches at the mouth of the Columbia River hit a record level (148,000 salmon), as did those at LaPush (22,852 salmon), and in the Strait of Juan de Fuca (229,142 salmon). In Puget Sound and the San Juan Islands the total catch of 555,723 salmon was the highest ever recorded in those areas due to the large catches of pink salmon.

Since the end of World War II there has been an accelerating trend toward private boat ownership, which has impaired a sport catch estimate system based partially upon reports from boathouses and rental boat agencies. As a result of the current trends, an order of the Washington State Director of Fisheries requires all sport salmon anglers, beginning in 1964, to carry, maintain, and return to the Department of Fisheries a free, nonlimiting punch card on which they will record their salmon catches. The new system will enumerate anglers for the first time and will yield needed information on freshwater salmon catches. (Washington State Department of Fisheries, March 6, 1964.)

Note: See Commercial Fisheries Review, June 1963 p. 52.

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FISHERY TECHNICIANS TO BE TRAINED AT PENINSULA COLLEGE:

Peninsula College in Port Angeles, Washington, is developing a two-year training program to prepare students as technicians for employment in fish hatcheries and fishery research laboratories. The first class is expected to start in September 1964. In addition to technical training, the course will include instruction in biology, chemistry, mathematics, English, and speech.

Peninsula College has been awarded a grant of \$29,100 by the W. K. Kellogg Foundation to assist in the development of the fishery technician training program. In addition, the Port Angeles Chamber of Commerce will construct a fish pond at the college. The Washington State Department of Fisheries will provide fingerlings for the pond and assist in its management.

This grant represents one of a series of recent commitments by the philanthropic organization to further semiprofessional and technical education in community junior colleges.



Wholesale Prices

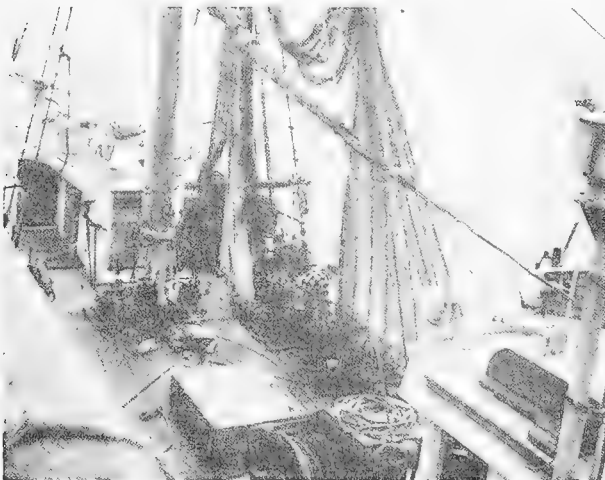
EDIBLE FISH AND SHELLFISH, MARCH 1964:

From February to March, prices were lower for nearly all of the major fishery products listed in the wholesale price index. The exceptions were higher prices for Great Lakes fresh-water fish because of increased demand during the Jewish holidays and some increase in prices for shucked oysters, fresh shrimp, and canned Maine sardines. The March 1964

| Wholesale Average Prices and Indexes for Edible Fish and Shellfish, March 1964 with Comparisons | | | | | | | | |
|---|------------------|------|---------------------|-----------|-----------------------|-----------|-----------|-----------|
| Group, Subgroup, and Item Specification | Point of Pricing | Unit | Avg. Prices 1/ (\$) | | Indexes (1957-59=100) | | | |
| | | | Mar. 1964 | Feb. 1964 | Mar. 1964 | Feb. 1964 | Jan. 1964 | Mar. 1963 |
| ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) | | | | | 104.1 | 109.0 | 109.8 | 117.3 |
| Fresh & Frozen Fishery Products: | | | | | 105.5 | 113.2 | 113.0 | 123.0 |
| Drawn, Dressed, or Whole Finfish: | | | | | 100.9 | 120.8 | 116.5 | 121.2 |
| Haddock, lge., offshore, drawn, fresh | Boston | lb. | .08 | .21 | 61.8 | 160.2 | 141.0 | 91.9 |
| Halibut, West., 20/80 lbs., drsd., fresh or froz. | New York | lb. | .30 | .31 | 89.2 | 90.2 | 96.1 | 122.2 |
| Salmon, king, lge. & med., drsd., fresh or froz. | New York | lb. | .32 | .33 | 114.2 | 116.0 | 118.4 | 132.7 |
| Whitefish, L. Superior, drawn, fresh | Chicago | lb. | .73 | .58 | 108.2 | 85.8 | 69.4 | 100.7 |
| Yellow pike, L. Michigan & Huron, rnd., fresh | New York | lb. | .70 | .62 | 114.7 | 101.6 | 80.3 | 113.0 |
| Processed, Fresh (Fish & Shellfish): | | | | | 116.1 | 114.0 | 115.4 | 125.5 |
| Fillets, haddock, sml., skins on, 20-lb. tins | Boston | lb. | .32 | .58 | 77.7 | 140.8 | 142.0 | 94.7 |
| Shrimp, lge. (26-30 count), headless, fresh | New York | lb. | .97 | .91 | 113.1 | 106.6 | 100.8 | 125.4 |
| Oysters, shucked, standards | Norfolk | gal. | 7.50 | 7.00 | 126.5 | 118.0 | 128.6 | 130.7 |
| Processed, Frozen (Fish & Shellfish): | | | | | 96.2 | 100.7 | 102.8 | 117.3 |
| Fillets; Flounder, skinless, 1-lb. pkg. | | | | | 98.9 | 98.9 | 98.9 | 97.6 |
| Haddock, sml., skins on, 1-lb. pkg. | Boston | lb. | .37 | .40 | 108.5 | 115.8 | 114.3 | 108.5 |
| Ocean perch, lge., skins on 1-lb. pkg. | Boston | lb. | .33 | .33 | 114.0 | 114.0 | 117.5 | 117.5 |
| Shrimp, lge. (26-30 count), brown, 5-lb. pkg. | Chicago | lb. | .74 | .77 | 87.2 | 91.3 | 95.5 | 123.4 |
| Canned Fishery Products: | | | | | 102.2 | 102.0 | 104.7 | 107.7 |
| Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. | Seattle | cs. | 21.75 | 21.75 | 94.8 | 94.8 | 102.4 | 107.9 |
| Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. | Los Angeles | cs. | 11.63 | 11.63 | 103.3 | 103.3 | 103.3 | 104.4 |
| Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs. | Los Angeles | cs. | 6.13 | 6.13 | 103.9 | 103.9 | 97.5 | 2/100.0 |
| Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. | New York | cs. | 9.21 | 9.09 | 118.2 | 116.5 | 114.9 | 116.2 |

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/New product replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.



Trawler with nets hung out for drying. This type of trawler is the mainstay of the New England food-fish industry.

wholesale price index for edible fish and shellfish (fresh, frozen, and canned) at 104.1 percent of the 1957-59 average was down 4.5 percent from the previous month. Compared with March 1963, prices this March were generally lower for most items with the overall index down 11.3 percent.

A marked 16.5-percent drop from February to March in the subgroup index for drawn, dressed, or whole finfish was the direct result of sharply lower ex-vessel prices at Boston for large haddock (down 61.4 percent). Prices for that species in February were very high because of extremely light haddock landings. Compared with the same month a year earlier, ex-vessel haddock prices this March were lower by 32.8 percent. The abrupt drop in haddock prices was partly offset by substantial increases in prices at Chicago for fresh Lake Superior whitefish (up 26.1 percent) for the Passover holiday trade, and a price rise at New York City for Great Lakes round yellow pike (up 12.9 percent). As compared with March 1963, the subgroup index was down 16.7 percent. Prices this March were lower than a year earlier for all items in the subgroup except fresh-water fish.

The subgroup index for processed fresh fish and shellfish in March 1964 was down only 1.8 percent from the previous month despite sharply lower prices for fresh haddock fillets (down 44.8 percent) at Boston. Compared with the same month in 1963, fresh haddock fillet prices were lower by 18.0 percent. From February to March, fresh shrimp prices at New York City rose 6.1 percent and prices for standard shucked oysters at Norfolk were up 7.2 percent. Prices this March for all items in the subgroup were below those of March 1963 and the index was down 7.5 percent.

From February to March, lower prices for frozen haddock fillets (down 6.3 percent) and a decline in prices for frozen shrimp (down 3 cents a pound) at Chicago were responsible for a 4.5-percent drop in the subgroup index for processed frozen fish and shellfish. March 1964 prices for other frozen fillets were unchanged from a month earlier. As compared with March 1963, the subgroup index this March was down 18.0 percent largely because of lower frozen shrimp prices and lower prices for ocean perch fillets.

March 1964 prices for most canned fishery products were unchanged from the previous month, but canned Maine sardine prices were up 1.5 percent. Those higher prices moved the subgroup index up 0.2 percent from February to March. But compared with March 1963, the index was down 5.1 percent. Prices this March were lower for canned Alaska pink salmon (down 12.1 percent) and canned tuna prices were slightly below those of the same month a year earlier. Prices for canned Maine sardines were a little higher than in March 1963 when stocks were higher than they had been for some time.



Wisconsin

FISHERY LANDINGS, 1963:

Total landings of fish at Wisconsin ports of Lake Superior and Lake Michigan (including Green Bay) in 1963 amounted to 16.2 million pounds--1.8 million pounds or 15 percent below landings for the previous year, according to data released by the U. S. Bureau of Commercial Fisheries.

Considerably less chubs (down 28 percent) and lake herring (down 58 percent) were landed in 1963 than in 1962, but there was some increase in the landings of alewives, and yellow perch landings were up 18 percent from the previous year. The 1963 landings of the more valuable species were lower than the previous year--whitefish was down 20 percent, and lake trout landings at Lake Superior were only about one-third those of the previous year because of restrictions placed on commercial fishing for that species.



Wisconsin fishing areas.

Landings in Wisconsin during 1963 from Lake Michigan accounted for 9.9 million pounds, Green Bay 3.8 million pounds, and Lake Superior 2.6 million pounds.

Four species of fish comprised 84 percent of the 1963 landings. They were chubs 35 percent; alewives 22 percent; yellow perch 20 percent; and lake herring 6 percent. The remainder was mostly carp and lake smelt.



HOW FAST DO FISH SWIM

How fast do fish really swim? Until recently 60 m.p.h. was thought reasonable for a really fast fish, but experiments at Aberdeen Research Laboratory, Scotland, and Cambridge University with fresh-water fish, show that they do not swim at such high speeds.

So far the highest accurately recorded speed is 27 m.p.h. for four feet for a barracuda in American waters. The speed was measured by a piscatometer--an instrument made from a fishing line fitted with accurate gauges to measure the tension on the line, and the speed at which it runs out.



International

FISHING LIMITS

MODIFIED 12-MILE FISHERIES LIMIT ACCEPTED BY 13 COUNTRIES AT EUROPEAN FISHERIES CONFERENCE IN LONDON:

A new "6-plus-6" fisheries convention has been signed by 13 of the 16 countries attending the European Fisheries Conference in London.

The new convention provides for an exclusive 6-mile fishery limit with an additional 6-12 mile zone open only by agreement to certain foreign fishermen with traditional fishing claims.

The new convention will be of unlimited duration, but contracting nations will have the right to withdraw after 20 years.

The 16 countries attending the conference were the 6 members of the European Economic Community (France, Germany, Italy, the Netherlands, Belgium, and Luxembourg), the 7 members of the European Free Trade Association (Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom), and also Iceland, Ireland, and Spain. The 3 countries which did not sign the new fisheries convention were Iceland, Switzerland, and Norway.

The conference also adopted resolutions on conservation, fisheries policing, and access to markets for fish. (EFTA Reporter, March 5, 1964.)

FISH MEAL

FISH MEAL PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-DECEMBER 1963:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Angola, Iceland, Norway, Peru, and South Africa/South-West Africa. Exports of fish

meal by FEO countries during 1963 were up 11.7 percent while their total production was up 4.9 percent from that in the previous year.

Table 1 - Exports of Fish Meal by Member Countries of the FEO, January-December 1963

| Country | December | | Jan.-Dec. | |
|---|----------|-------|-----------|---------|
| | 1963 | 1962 | 1963 | 1962 |
| ... (1,000 Metric Tons) ... | | | | |
| Angola | 7.0 | 3.9 | 30.1 | 32.6 |
| Iceland | 17.6 | 7.5 | 99.1 | 70.9 |
| Norway | 19.1 | 10.4 | 103.6 | 61.7 |
| Peru | 104.7 | 107.6 | 1,159.4 | 1,066.0 |
| So. Africa (including S.W. Africa) | 13.4 | 11.3 | 198.4 | 192.9 |
| Total | 161.8 | 140.7 | 1,590.6 | 1,424.1 |

Table 2 - Production of Fish Meal by Member Countries of the FEO, January-December 1963

| Country | December | | Jan.-Dec. | |
|--|----------|-------|-----------|---------|
| | 1963 | 1962 | 1963 | 1962 |
| ... (1,000 Metric Tons) ... | | | | |
| Angola | 7.4 | 3.7 | 31.4 | 32.8 |
| Iceland | 8.7 | 2.2 | 87.8 | 96.1 |
| Norway | 9.6 | 4.6 | 131.7 | 120.9 |
| Peru | 139.7 | 155.9 | 1,159.2 | 1,120.8 |
| So. Africa (including S. W. Africa) | 1.2 | - | 238.2 | 201.2 |
| Total | 166.6 | 166.4 | 1,648.3 | 1,571.8 |

In 1963, Peru accounted for 72.9 percent of total fish-meal exports by FEO countries, followed by South Africa with 12.5 percent, Norway with 6.5 percent, Iceland with 6.2 percent, and Angola with 1.9 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 18, 1964.)

FOOD AND AGRICULTURE ORGANIZATION

MODEL STANDARD FOR WORLD TRADE IN FISHERY PRODUCTS WORKED OUT BY FISHERIES GROUP:

A model standard and code of practices to cover fish and fish products in international trade has been worked out by an expert fisheries group of the Food and Agriculture Organization (FAO). It is the first time this had been done on an international basis.

The model standard is a result of the February 1964 meeting in Rome of 12 fisheries

International (Contd.):

experts from as many countries. It covers the definition and accurate description of fish and fish products important in world trade, quality requirements for such products, permissible additions to the products (salts, oils, preservatives, vegetables, or other food non-fish products), and marking and labeling requirements. The model standard is to be distributed by FAO to its 111 member nations. The meeting was held as part of the work being carried out under the Joint Food and Agriculture Organization/World Health Organization Codex Alimentarius Commission. The model will go as a working document to the FAO Commission's next meeting in Geneva in September 1964.

The fisheries group of experts also drew up a list of fish and fish products which should have priority for standardization. It includes 13 products -- herring and sardine canned in oil or tomato sauce, tuna, bonito and mackerel canned in oil or brine, canned Pacific salmon, canned crab meat, canned shrimp, frozen tuna, frozen herring, frozen Pacific salmon, frozen crustaceans (such as shrimp, lobster, crab, etc.), salted herring and salted cod.

In 1957, 1 out of every 4 tons of fish landed was exported, in one form or another. In 1961, that ratio had grown to 1 out of 3. It is believed to be even higher now.

The experts noted that each major fishing country already had established food laws, regulations and quality standards for its products. The job now facing world fisheries is to mold these into a commonly-accepted international instrument. (Food and Agriculture Organization press release, Rome, February 21, 1964.)

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CARIBBEAN FISHERIES DEVELOPMENT PROJECT:

The Food and Agriculture Organization on March 13, 1964, announced the appointment of a fisheries expert (Harry C. Winsor of St. John's, Newfoundland, Canada), as manager-designate for a United Nations Special Fund fisheries project in the Caribbean region. The expert was scheduled to arrive in the Caribbean in mid-April for a first round of discussions with participating governments. For this purpose he was to make his temporary headquarters at the U. N. office in Port of Spain, Trinidad. His permanent head-

quarters is yet to be determined. The 4-year Special Fund project is designed to provide, through exploratory fishing, market studies, and demonstration and training, a basis for fisheries development in Caribbean countries. The cost of the project to the Special Fund will be \$1,558,500. The Caribbean nations and territories participating will contribute \$712,800 in cash plus a wide range of local services.

The project is expected to cover the Dominican Republic, Haiti, Trinidad and Tobago, French Guiana, Guadalupe, Martinique, Surinam and the Netherlands Antilles, British Guiana, Barbados and the Leeward Islands, and Puerto Rico. (Food and Agriculture Organization, Rome, March 13, 1964.)

GENERAL AGREEMENT ON TARIFFS AND TRADE

21ST SESSION HELD AT GENEVA:

An assessment of progress made in the General Agreement on Tariffs and Trade (GATT) Program for the Expansion of International Trade since the 1963 Ministerial meeting was to be the major topic at the 21st Session of the Contracting Parties to the GATT meeting at Geneva, February 24 to March 20, 1964. At the meeting, the Contracting Parties were to consider an agenda of more than 50 items.

Under that topic the Contracting Parties were to review preparations of the Trade Negotiations Committee for the forthcoming Kennedy Round of tariff negotiations and developments in the intensive efforts under way to remove existing barriers to the export trade of less developed countries and seek out positive measures by which such trade can be expanded. In the context of new positive measures the session was to hear a report by an expert group recommending GATT activity in the field of trade information and trade promotion advisory services, and a report of a special committee which has been examining proposals for a new chapter of the GATT which would more clearly reflect the responsibilities and functions of the Contracting Parties with respect to the trade and development needs of the less developed countries.

Developments in the various regional economic groupings were also to be discussed. The European Economic Community (EEC) was expected to present its recent agreements with Turkey and the Associated Overseas

International (Contd.):

Countries to the Contracting Parties, as well as a report on other activities in the Community. Other groupings to report included the Latin American Free Trade Association, the Central American Common Market, and the Equatorial Customs Union.

Since the last GATT Session in 1962, some 20 countries have adhered to the GATT, bringing total membership now to 61. The Contracting Parties will confirm these recent accessions and also consider the applications for provisional accession of Iceland and possibly Viet-Nam.

The efforts in the GATT to remove quantitative restrictions, which have been increasingly successful, were to be continued at the 21st Session. Notification and examination procedures for those remaining restrictions inconsistent with GATT provisions were to be scrutinized and reports to be reviewed on consultations held during the past year with those countries which still maintain, consistent with the GATT, restrictions for balance-of-payments reasons.

The GATT is the basic international instrument guiding commercial relations among the nations of the world. The provisions of the GATT are designed to expand international trade and thereby to raise living standards, increase productive employment, and utilize more fully the resources of the world. The meeting of the Contracting Parties provides an international forum to discuss trade policy problems and to resolve trade difficulties in a manner conducive to the growth rather than the reduction of trade levels.

Note: See Commercial Fisheries Review, January 1963 p. 68.

INTER-AMERICAN TROPICAL TUNA COMMISSION

LOWER 1964 QUOTA RECOMMENDED FOR YELLOWFIN TUNA CAUGHT IN EASTERN PACIFIC:

A 1964 catch-limit (quota) of 77,000 tons of yellowfin tuna from the eastern tropical Pacific was recommended to member governments by the Inter-American Tropical Tuna Commission (United States, Costa Rica, Ecuador, Panama, and Mexico) at its 16th annual meeting in San Diego, Calif., March 18-19, 1964. This is 4,000 tons below the present estimated sustainable yield of about 81,000 tons. The lower quota for 1964 represents the first significant step the Commission has taken toward rebuilding yellowfin tuna stocks

to their maximum productive level of about 91,000 tons.

At the meeting, the Commission's staff had suggested a quota of 74,000 tons aimed at bringing the resource back to full productivity quickly. The Commission felt that economic and other factors needed to be considered and therefore recommended the 77,000-ton quota.

The meeting was attended by delegations from Costa Rica, Ecuador, Mexico, and the United States. Mexico, which was represented for the first time, had a three-man delegation. The fifth member of the Commission, Panama, was represented by an observer from the Los Angeles (Calif.), Panamanian Consulate.

An Intergovernmental meeting on Yellowfin Tuna Conservation was held the following day, March 20, in order to obtain an agreement on the mechanics for enforcing the Commission's recommendations. The governments with voting power (Costa Rica, Mexico, Ecuador, Japan, and the United States) agreed that they were prepared to put regulations into effect when all nations fishing the resource on a meaningful scale agree to put into force adequate conservation measures. United States regulations will not be effective until all nations fishing on a meaningful scale have agreed to regulate their yellowfin tuna fishery.

At the April 1963 meeting of the Commission held in Panama, Republic of Panama, a catch quota of 81,000 tons was established, but with a provision for the reservation of 2,000 tons of the yellowfin tuna quota for allowance for incidental catches when fishing for other species, such as skipjack and big-eyed tuna, after the closure of unrestricted fishing for yellowfin tuna.

Note: See Commercial Fisheries Review, June 1963 p. 55.

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MEXICO JOINS INTERNATIONAL TUNA GROUP:

On January 29, 1964, Mexico deposited adherence, becoming effective February 29, 1964, to the Convention for the establishment of an Inter-American Tropical Tuna Commission, which entered into force March 3, 1950. The other members of the Commission are the United States, Costa Rica, Ecuador, and Panama. (Bulletin, U. S. Department of State, February 17, 1964.)

International (Contd.):

INTERNATIONAL CONVENTION FOR
THE NORTHWEST ATLANTIC FISHERIESCANADA RATIFIES PROTOCOL
AMENDMENT CONCERNING
HARP AND HOOD SEALS:

On January 23, 1964, Canada deposited ratification of a Protocol to the International Convention for the Northwest Atlantic Fisheries. The Protocol (done at Washington July 15, 1963) relates to harp and hood seals and is intended to bring those species within the responsibility of the Northwest Atlantic Fisheries Commission. As of February 1964, the Protocol was not in force. (Bulletin, U.S. Department of State, February 10, 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 45.

INTERNATIONAL NORTHWEST
PACIFIC FISHERIES COMMISSIONJAPAN-SOVIET FISHERIES CONFERENCE
OPENED IN MOSCOW ON MARCH 2, 1964:

The International Northwest Pacific Fisheries Commission (Soviet Union and Japan) scheduled a series of meetings which began on March 2, 1964, in Moscow. The Commission sets the annual Soviet and Japanese catch quotas for salmon and king crab in the Northwest Pacific Ocean.

The Japanese delegation to the Moscow negotiations was headed by the Vice President of the Japan Fisheries Association and included senior officials from the Ministry of Foreign Affairs and the Fishery Agency. Attending as advisors were representatives from leading Japanese fisheries companies and fisheries associations and a representative from the Hokkaido Prefectural Government. (Fisheries Attache, United States, Embassy, Tokyo, February 12, 1964.)

INTERNATIONAL PACIFIC HALIBUT COMMISSION

BERING SEA HALIBUT CATCH IN AREA 3B
NORTH TRIANGLE, MARCH 28, 1964:

The total halibut catch by United States, Canadian, and Japanese vessels fishing in Area 3B North Triangle in the Bering Sea was estimated at 750,000 pounds through March 28, 1964, by the International Pacific Halibut Commission (IPHC). Approximately 36 United States vessels, 28 Canadian vessels, and not more than 7 Japanese vessels began fishing in Area 3B North Triangle when it opened March 25, 1964.

Fishing weather in the first days of the season was very good and the Alaskan earthquake did not affect the fleet, or shore facilities at Sand Point, Alaska. However, the catch rate was said to be unsatisfactory from an economic standpoint for Canadian and United States vessels, which can only stay on the grounds about 12 days before having to depart for landing ports with their catches. The IPHC considers that the area's catch limit of 6,393,340 pounds will not be attained for a considerable period of time.

The number of Japanese vessels expected to operate in the area during the first month was 7, but it appears that some of those vessels may have been delayed since the maximum number of Japanese vessels making landings on any day was 3.

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NORTH PACIFIC HALIBUT
REGULATIONS FOR 1964:

Fishing for halibut began May 1 at 6 p.m. in all North Pacific areas (Areas 1, 2, and 3A) except in the Bering Sea (Area 3B North and Area 3B North Triangle) and waters west of Area 3A, not including the Bering Sea (Area 3B South), according to the recommendation of the International Pacific Halibut Commission to the Governments of the United States and Canada for the 1964 fishing season. The regulations this year contain several important changes from 1963.

March 25 was the opening date for fishing in Area 3B North and Area 3B North Triangle. The opening date for fishing in Area 3B South was April 6. This year fishing in Areas 1, 2, and 3A began 8 days earlier than the opening date of May 9 last year. Area 3B North was opened to fishing on March 25 last year, the same as this year, but Area 3B South opened April 19 last year, 13 days later than the opening date this year.

The opening and closing hours of the various regulatory areas shall be 6 p.m. Pacific Standard Time of the date indicated, except in Areas 3B North Triangle and 3B North where it shall be 6 p.m. local time.

Fishing areas shall be: Area 1--south of Willapa Bay, Washington; Area 2--between Willapa Bay and Cape Spencer, Alaska; Area 3A--between Cape Spencer and Shumagin Islands; Area 3B South--waters west of Area 3A, not including Bering Sea; Area 3B North Triangle--waters between a line from Unimak Pass to the Pribilof Islands, north of the Aleutian Islands and east of 170° W. longitude; Area 3B North--waters in Bering Sea outside of Area 3B North Triangle.

In Area 1 the fishing season, without catch limit, shall terminate at the same time as that in Area 2. (Last year Area 1 was open to fishing to November 30 or the date on which Area 2 closed.)

In Area 2 the fishing season shall terminate at the time of attainment of the catch limit of 25 million pounds or on September 15, whichever is earlier. This is 3 million pounds less than last year's quota of 28 million pounds. The catch limit in Area 2 in 1963 was not attained by November 30 when the season ended. As of October 17, the Area 2 catch was 25.6 million pounds.

In Area 3A the fishing season shall terminate at the time of attainment of a catch limit of 34 million pounds or on October 15, whichever is earlier. There is no change in the catch limit which is the same as last year (in 1963 Area 3A closed on August 9).

International (Contd.):

In Area 3B South the fishing season shall terminate at the time of attainment of a catch limit of 4 million pounds or on October 15, whichever is earlier (the closing date last year was October 15 with no catch limit).

In Area 3B North the fishing season, without catch limit, shall terminate on October 15 (the closing date last year was October 15).

In Area 3B North Triangle the fishing season shall terminate at time of attainment of a catch limit of 6,393,340 pounds or on October 15, whichever is earlier. This catch limit is to be shared between Canada, the United States, and Japan, and its administration will involve a system of daily reporting of the amount and location of catches to the Commission by the fleet. Last year the quota for Area 3B North Triangle was 11 million pounds but the area closed on October 15 when 10,944,000 pounds had been taken by the three nations (Canada 4,058,000 pounds, United States 3,216,000 pounds, and Japan 3,670,000 pounds).

In 1963 the Pacific halibut fishery regulations were revised effective June 8, 1963. The revised regulations superseded those which became effective on March 21, 1963, and were concerned primarily with division of Area 3B North into two areas described as Area 3B North and Area 3B North Triangle. There also were other changes made in wording and in the description of the regulatory areas.

The Commission in 1964 will provide 10 days notice of closure of Areas 1 and 2, and 18 days notice of the closure of Area 3B and Area 3B South.

The Commission's recommendations for the 1964 season were announced on January 30 at the conclusion of its fortieth annual meeting at Seattle, Wash., with Chairman William A. Sprules of Ottawa, Ont., presiding.

The Halibut Commission is responsible to Canada and the United States for the investigation and regulation of the halibut fishery of the northern Pacific Ocean and Bering Sea. Its specific function is the development of the stocks of halibut to levels that will permit the maximum sustained yield, and its decisions regarding regulation are based upon the findings of its scientific staff.

During the past 32 years of Commission management, there has been progressive improvement of the stocks and increase in annual yield. The annual catch, which had declined to 44 million pounds in 1931 (the year before regulation), has averaged 72 million pounds during the past five years. The 1963 catch amounted to 71.2 million pounds, down nearly 4 million pounds from the previous year, but does not include the 3.7 million pounds taken by Japanese fishermen in Area 3B North Triangle. The 1963 halibut catch by United States fishermen amounted to 34.2 million pounds, or 6 million pounds less than in 1962 while the Canadian catch of 37 million pounds was 2 million pounds more.

The Commission reviewed the past year's fishery and the research conducted by its scientific staff. It also dealt with administrative matters and approved a research program for 1964. In the course of its sessions the Commission conferred not only with its staff, but also with representatives of the halibut fishermen's, vessel owners' and dealers' organizations. The scientific findings and all suggestions for regulations in 1964 were discussed at meetings.

The Commission announced also that the 1965 annual meeting will take place at Vancouver, British Columbia, Canada. The date was not specified.

Since in the past the United States and Canadian Governments have accepted the recommendations of the Commission without changes, it is fairly certain the 1964 regulations as recommended by the Commission will be approved by the two Governments.

INTERNATIONAL SEAWEED SYMPOSIUM

FIFTH MEETING TO BE HELD IN AUGUST 1965 IN HALIFAX, CANADA:

The Vth International Seaweed Symposium will be held in Halifax, Canada, from August 25 to 28, 1965. Previous symposia have been held in Edinburgh, Scotland (1952); Trondheim, Norway (1955); Galway, Ireland (1958); and Biarritz, France (1961). The invitation for 1965 was extended by the National Research Council of Canada, the Nova Scotia Research Foundation, and Dalhousie University. It has been accepted by the International Advisory Committee of the Symposium.

The symposium is open to all those who are interested in seaweeds and particularly in the problems associated with their proper utilization and conservation. There will be two classes of membership, regular and associate.

In order to give greater unity to the program, it is hoped that original papers can be grouped within the following broad divisions: ecology, taxonomy, physiology (including studies of growth), carbohydrates, non-carbohydrate constituents, metabolism algae as food, agricultural applications, and manufacture of algal extracts.

There will be no official language but it is desirable that papers should be read in either English or French.

There will be a post-conference excursion from August 29 to 31 to the prolific beds of seaweed in southwestern Nova Scotia around Digby.

Additional information about the symposium may be obtained by writing to The Secretariat, V International Seaweed Symposium, National Research Council Laboratories, 1411 Oxford Street, Halifax, Nova Scotia, Canada.

NORTH PACIFIC FUR SEAL CONVENTION

PROTOCOL AMENDING INTERIM CONVENTION RATIFIED BY UNITED STATES:

On February 6, 1964, the United States deposited ratification of the Protocol amending the interim convention of February 7, 1957, on conservation of North Pacific fur seals. (The ratification was signed by the President of the United States on the same day it was

International (Contd.):

deposited.) The Protocol, which was done at Washington, D. C., October 8, 1963, was not in force at the time of United States ratification. (Bulletin, the U. S. Department of State, March 16, 1964.)

ORGANIZATION FOR ECONOMIC
COOPERATION AND DEVELOPMENT

NINTH MEETING OF
FISHERIES COMMITTEE:

The Ninth Meeting of the Fisheries Committee of the Organization for Economic Cooperation and Development (OECD) was held in Paris, France, February 10-12, 1964. Representatives from 17 member countries participated in the meeting, as well as from the European Economic Community (EEC), Food and Agriculture Organization (FAO), and the Council for Europe.

Significant agenda items for this meeting included (1) an examination of the different subsidies and other financial support to the fishing industries of member countries, (2) study of general services rendered to the fishery industry, (3) study of price systems, (4) study of the influence of recent changes in customs duties for fishery products, and (5) a review of the operational program for 1963 and 1964.

The report on the examination of the different subsidies and other financial support to the fishing industries of member countries was discussed in detail, country-by-country, and statements by a number of the member countries were accepted without comments or only with clarifying comments or minor revisions. The Secretariat announced that each country would be given a final draft of its chapter for a quick review. Later, the completed report would be submitted to the Chairman and Vice-Chairman for a final review before its submission to the OECD Council for approval.

The report classifies the various subsidies and financial supports of the individual member countries and recommends that certain measures harmful to trade should be progressively eliminated according to "reasonable" timetables. The Fisheries Committee urged the designation of an early beginning date for the abolition of certain subsidies in conformity with the timetables. The submission of this report to the Council for final adoption comes after a long period of debate and marks

a significant step in providing data and recommendations for achieving international cooperation in the fields of national fishery subsidies and financial support.

It was recommended that the draft study on general services to the fishery industries follow a report on Germany but with less detail. On the study on price systems, the Committee favored the line followed in the report on Germany, but suggested information might be added on fees or costs involved.

It was also recommended that the study on the influence of recent changes in customs duties for fishery products should be limited to fresh and frozen fillets, fresh and salted herring, and canned fish in the Common Market countries. The United States request for the addition of fish meal and fish oil was recorded for future consideration. Belgium asked that a study of European Free Trade Association (EFTA) duties be made.

The titles of projects listed under the operational program for 1964 follow:

1. Market Information Service.
2. Meeting of Technologists of Fish Processing.
3. Sanitary Regulations for Canned Fish.
4. Multilingual Nomenclature of Fishery Products.
5. Study of a Rational Exploitation of the Resources of the Sea.
6. Study of the Market for Pelagic Fish (Herring).

The study on Sanitary Regulations for Canned Fish will be guided by the results of a meeting of the Codex Alimentarius Committee of Experts on World-wide Standards for Fish and Fish Products, which was held in Rome, February 18-20, 1964.

The Fisheries Committee officers who served in 1963 were all unanimously re-elected to serve in 1964. The next meeting of the OECD Fisheries Committee is tentatively scheduled for the end of May 1964. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 24, 1964.)

Note: See Commercial Fisheries Review, August 1963 p. 76, May 1963 p. 54, February 1963 p. 62.

International (Contd.):

UNITED STATES-IRISH COOPERATION
IN JOINT FISHERIES PROJECTS

The details of joint Irish-United States fisheries research and development projects which could lead to the establishment of an Irish deep-sea fishing industry were announced by the Chairman of the Irish Sea Fisheries Board at a press conference held in Dublin in January 1964. Under the project, a research vessel will be permanently loaned to the Irish Fisheries Division of the Department of Lands by the United States, for use in exploring the North Atlantic to discover new fishing grounds. There is some belief that a tuna resource exists in the North Atlantic in the path of the Gulf Stream.

The announcement followed a November 1963 visit to Ireland by Donald L. McKernan, Director of the U. S. Bureau of Commercial Fisheries, and his collaboration with Brendan O'Kelly, Chairman of the Irish Sea Fisheries Board, in the preparation of a basic report on United States and Irish cooperation in joint fisheries projects. In announcing the details of the project, the chairman said that a team of United States experts was expected to arrive in Ireland in April to begin work with personnel of the scientific section of the Irish Fisheries Division. He said that no real expansion of the Irish fishing industry could take place unless it was based on fuller research and development of the fish resources around their shores.

The chairman added that comprehensive research, however, required considerable capital investment and for that reason the joint cooperative effort in the North Atlantic was a practical approach to the problem and would be of immense benefit to both countries. It was pointed out that Irish and United States fishery problems were very similar and that both countries were anxious to improve the efficiency of their fisheries and to survey and research alternative fishery resources more fully.

In the surveys, special attention would be given to the expansion of shellfish fisheries.

Educational proposals were designed to supplement existing educational programs toward recruitment of young people in the fishing industry and the training of skippers. It was also mentioned that the credit facili-

ties available to qualified applicants under the Irish Fisheries Board Marine Credit Plan were unequalled in any other Irish industry. (United States Embassy, Dublin, December 27, 1963, and January 10, 1964; The Fishing News, January 17, 1964.)

**Argentina****ATLANTIC FISHING GROUNDS OFF
ARGENTINA WORKED BY
ITALIAN FREEZER-TRAWLERS:**

The Italian freezer-trawler Genepesca I fished off the coast of northern Argentina in June and July 1962 taking whiting, flounder, sea bream, corvina, and other groundfish in the Rio de la Plata area. The Captain of the vessel reported that fish stocks in the area appeared to be abundant, but that the fish caught differed somewhat from that usually consumed in Mediterranean areas. (Editor's Note: Other sources have reported that the convergence of the Antarctic Malvinas Current with the Equatorial Brazilian Current in an extensive continental shelf area off the Argentine coast between 38° and 44° south latitude creates favorable conditions for deep-sea trawling. International fisheries experts have estimated the annual possible yield of those waters at 3-3.5 million metric tons of fish per year.)

Italian vessels have fished off Argentina between 36° and 42° south latitude. They encountered regular depth variations and sandy bottoms which made trawl-net handling easy. They reported that on South American fishing grounds they preferred depths of 120 to 130 meters (394 to 426 feet) in winter, while in summer the most satisfactory trawling depth varied from 250 to 300 meters (820 to 984 feet). That was the main reason why they fished as far south as 42° latitude in summer, but stayed closer to 36° latitude in winter. (Alieia, January 1964.)

Note: See Commercial Fisheries Review, November 1963 p. 54.

**Australia****AIR SHIPMENT OF ANESTHETIZED
LIVE SPINY LOBSTERS
CONSIDERED BY EXPORTERS:**

The use of anesthetics to develop air shipments of live spiny lobsters to France is be-

Australia (Contd.):

ing explored by Australian exporters. Various anesthetics have long been employed to calm fish for experimental purposes, and this has led to anesthetics being used in air shipments of live fish, but it is believed that such methods have not been tried on shellfish.

One of the best known drugs in this field is tricaine methanesulfonate. Small fish and amphibians can be quieted by immersion in a solution of one gram of the compound in 1,000 cc. of water. For large sharks and rays, the solution is sprayed with a syringe or hand sprayer on the gills, and within a minute the fish may be handled safely.

Small fish can be shipped in sealed plastic bags of water and oxygen to which is added small amounts of anesthetic to produce a tranquillizing effect. Less oxygen is consumed and survival is higher. In Australia, anesthetics have been used successfully to transport fingerling trout in Victoria and mature brown trout in Tasmania.

Amyl alcohol, methylparafynol, chloral hydrate, and liquid quinaldine are other anesthetics that have been successfully used in the shipment of fish. (Australian Fisheries Newsletter, February 1964.)

**Belgium-Luxembourg****IMPORT QUOTA AND DUTY FOR FRESH AND FROZEN COOKED CRAB AND SHRIMP, JANUARY 1, 1964-MARCH 31, 1965:**

Belgian Ministerial Order of December 24, 1963 (Moniteur Belge, No. 12, January 16, 1964) set the annual combined quota for fresh or frozen crab and shrimp (Belgian Tariff No. ex 16.05 A). The 200 metric tons for calendar year 1963 was increased to 250 tons for the period January 1, 1964-March 31, 1965. Crab and shrimp, formerly duty free under the old quota, will be subject to an import duty of 3 percent ad valorem under the new quota. The quota applies to imports from both EEC countries and non-EEC countries. Goods entering under a tariff quota may not be re-exported from the Belgo-Luxembourg Economic Union in the condition in which they were imported.

The description of the goods as it appeared in the order is: "crabs of the varieties (king; 'kanasaki' and 'kegani' and shrimps of the variety 'Pandalus platyceros japonicus,' simply boiled and peeled or decorticated, including frozen intended for the canning and bottling industry." (Board of Trade Journal, February 7, 1964.)

**Canada****FISHERIES MINISTER COMMENTS ON PROPOSED 12-MILE FISHERIES LIMITS:**

A question was asked in the Canadian House of Commons on March 13, 1964, concerning the proposed extension of Canadian fisheries limits to 12 miles on May 15, 1964. The question asked, in part, was: "...Since it is the Minister's intention to unilaterally extend Canada's fishing limits to 12 miles on May 15, will he tell the House what steps are being taken to prevent any retaliatory action by the United States that would be detrimental to Canada's fishing industry?" In response, the Canadian Minister of Fisheries said, "Mr. Speaker, in reply I wish to say that there is no indication whatsoever that any measures of retaliation will be taken by the United States." (United States Embassy, Ottawa, March 19, 1964.)

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JOINT CANADIAN-JAPANESE FISHERY BASE IN NEWFOUNDLAND PROPOSED:

One of Japan's largest fishing companies is interested in establishing a joint Japanese-Canadian fishing and processing base in Newfoundland. The company is said to be negotiating with Canadian interests for the establishment of such an enterprise. Under consideration is a plan to base at Newfoundland about seven 300- to 500-ton trawlers which would supply fish to a shore-based processing plant. (Suisan Tsushin, March 5, 1964.)

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TRADE MISSION EXPLORES LATIN AMERICAN MARKET FOR FISH-PROCESSING EQUIPMENT:

On February 25, 1964, six Canadian engineers began a month-long tour of Latin America, with visits scheduled in Mexico, Ecuador,

Canada (Contd.):

Peru, and Chile. The tour, which was sponsored by the Canadian Department of Trade and Commerce, was designed primarily to investigate potential markets for Canadian-designed fish-processing equipment. The Mission was made up of 4 representatives of consulting engineering firms, 1 representative of an equipment manufacturing firm, and an engineer from the Canadian Department of Trade and Commerce, who acted as Mission Secretary.

Four of the five companies represented on the Mission belong to the Canadian Food and Fish Plant Consortium, a business affiliation of some 20 engineering and machinery manufacturing firms, which was formed in late 1963. The Consortium's objective is to pool resources for more effective development of export business. Its membership can offer a full range services and facilities from design and economic studies to the provision of all the specialized machinery employed in food- and fish-processing plants. (Canadian Department of Trade and Commerce, Ottawa, February 24, 1964.)



Cape Verde Islands

JAPANESE TUNA BASE TO BE CONSTRUCTED:

A Japanese trading firm and the Kanagawa Tuna Fishermen's Cooperative Association, together with a United States tuna-canning firm, are expected to enter into a formal agreement with a firm in the Cape Verde Islands (Portuguese) to establish a tuna base at Porto Grande, Sao Vicente Island. The Cape Verde firm presently operates a 720-ton capacity cold-storage plant. Under the joint partnership agreement, the holding capacity of that plant will be increased to 3,000 tons, and medical and maintenance facilities will also be constructed.

The Kanagawa Association plans to assign a fleet of 20 tuna long-liners to the Cape Verde base as soon as the base facilities are completed. The catch will be transshipped to the United States firm's tuna plant in Puer to Rico. (Suisan Tsushin, February 27, 1964.)



Chile

JOINT TUNA ENTERPRISE WITH JAPAN:

The Production Development Corporation of Chile (CORFO) has approached a Japanese fishing company to establish a joint tuna-fishing enterprise in Chile. The Japanese firm (which is conducting a joint resource investigation with Chile on centolla crabs off southern Chile) has not yet determined the feasibility of CORFO's proposal.

Informed sources in the Japanese Fisheries Agency feel that there may be problems regarding the establishment of such an enterprise, since Chile claims a 200-mile territorial sea limit. (Suisancho Nippo, March 13, 1964.)

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NEW FISH-MEAL FACTORY AT IQUIQUE DEDICATED:

The large new fish-meal factory built at Iquique, Chile, as a joint Chilean-South African venture was officially dedicated in November 1963. In an address by the president of the fish-meal factory, he emphasized that it was an example of how Chileans and foreigners could work together and how important it was for Chile to expand its industries in order to provide foreign exchange.

In another speech, the representative of the President of Chile spoke of the past greatness and collapse of Chile's nitrate era, and that recent developments together with new government legislation made it possible to provide the incentives for attracting the national and foreign capital necessary for the development of Iquique's (Province of Tarapaca) natural resources. One of the incentives was making the area a free industrial zone.

The new factory at Iquique is said to be in many ways an extension to the west coast of South America of techniques and equipment evolved by the fish-meal industry of South and South-West Africa. The joint venture had its inception in late 1962 when South African capital was invested to build a fish-meal factory in Chile. About that time, engineers and building contractors from South Africa went to Chile to build the factory, as well as fishing vessel captains and vessel engineers who also went there to fish for the new factory. (The South African Shipping News and Fishing Industry Review, December 1963.)

Note: See Commercial Fisheries Review, January 1963 p. 115.

Denmark

"CAVIAR" PLANT PLANNED FOR NORTHERN GERMANY:

A large Danish fish-processing company in Glyngøre, Denmark, plans to establish a fish-processing plant in northern Germany to produce Danish "caviar" for German, Belgian, and other European Common Market country markets. The caviar is produced from "lumpsuckers" or lumpfish (Cyclopteridae) and is a significant Danish export item. In 1963, Denmark's total exports of that type of "caviar" amounted to 264 metric tons valued at 3,009,946 kroner (US\$436,400). The planned construction in Germany makes it easier to meet strict German regulations on the processing of that semipreserved product and also many mean that Denmark's entry into the Common Market is not expected to occur very soon. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 4, 1964.)



Faroe Islands

FISHING LIMIT OF 12 MILES STIRS REACTIONS:

The Faroese fishing limit of 12 nautical miles came into effect March 12, 1964, ending the fishing rights of British trawlers in the 6- to 12-mile zone around the Faroe Islands. The limit will also prevent Soviet fishermen from entering the Faroese 12-mile coastal zone to transfer catches.

The Faroese Lagting intends to make fishing limit violations more costly by increasing the minimum fine for illegal trawling from Kr. 10,000 (US\$1,450) to Kr. 30,000 (\$4,350). The catch and gear of vessels violating the limits will also be subject to confiscation. The patrol vessels available to watch for violations off the Faroe Islands include the Danish inspection vessels Ingold and Vaedderen. Both vessels carry helicopters as well as advanced electronic systems for accurately determining their own position and those of fishing craft violating the limits.

British fishing organizations notified the Government of Denmark that Faroese landings of iced fish in British ports as well as Faroese shipments of frozen fish to Britain would be subject to quarterly quotas beginning April 1, 1964, as a result of the extension of

Faroese fishing limits. It has been reported that the quotas will be set so that the value of current Faroese landings and shipments does not exceed the average value of those in the last 10 years. The annual quota would then be divided into quarterly limits of Kr. 5 million (\$725,000) in the first and fourth quarters and Kr. 3.5 million (\$507,500) in the second and third quarters. The value of the total quota for the year would be about one-third less than the value of average Faroese fishery exports to Great Britain during 1961-1963. The reduction in Faroese fishery exports to Britain actually may be much greater. Iced fish landings, which make up about 90 percent of the exports, are delivered mainly in the October and January quarters, and it has been reported that unused portions of the April and July quarterly quotas may not be transferred.

Faroese iced fish landings in British ports totaled about 19,400 metric tons in 1963, compared with 20,400 tons in 1962, and 21,900 tons in 1961. The probable course for the Faroese will be to land the quotas permitted in Great Britain. The remainder of the Faroese catch would then be landed in the Faroe Islands. Faroese fishermen are uncertain whether catch returns from landings in their home ports, including time and travel saved, would equal returns from landings in British ports.

Faroese processing interests would welcome the additional raw material. If salted fish prices remain high, part of the new supply would be salted, but it is more probable that the greatest effort would be devoted to processing fish fillets for sale in United States and Continental markets. Additional processing capacity would be required to handle most of the diverted catch. There could be some increase in hand filleting, but not much surplus mechanical filleting capacity is available. However, the Economic Committee of the Government of Denmark has approved a Kr. 3.6 million (\$522,000) guarantee for the construction of a Kr. 4.3 million (\$624,000) fish fillet-processing plant in Klaksvig (Faroe Islands), with an annual capacity of 3.3 million to 4.4 million pounds of fillets. The new plant would be able to process from 11.0 million to 13.2 million pounds of whole fish a year. Such a plant could possibly be completed late in 1964 when Faroese iced fish landings become substantial.

If about one-third of the usual Faroese iced fish landings in Britain are diverted to the Faroe Islands, it will mean additional supplies

Faroe Islands (Contd.):

of about 15.5 million pounds of fish, mostly cod, will be available each year in the Faroe Islands to produce about 6 million pounds of fillets for United States and Continental markets. Because of the limitation on transferring unused quotas, still more fish might become available. However, limited fillet-processing capacity and high prices for salted cod might prevent all of the new supply being used to produce fillets.

United States imports of frozen fillets from the Faroe Islands increased from 1,159 tons valued at Kr. 3.8 million (\$551,000) in 1961 to 1,602 tons valued at Kr. 5.0 million (\$725,000) in 1962, and 2,725 tons valued at Kr. 8.7 million (\$1.3 million) in 1963.

There have been reports that Danish processors might be interested in landings of Faroese fish but it remains only a possibility which may be considered later in the year.

Danish, Faroese, and British interests are reported to be preparing to establish a joint company to handle imports of Faroese fish into Grimsby, England, where it is thought the limitations on Faroese shipments may not be as restrictive. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 4 and 11, 1964.)

Note: Kroner (Danish) 6.90 equal US\$1.00.

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FISHERIES TRENDS, 1963:

Catch: Despite the addition of 11 new fishing vessels in 1963, the Faroese fisheries catch in 1963 was 3 percent less than in 1962. A small increase in the herring catch was offset by a drop in the catch of cod and other fish (table 1).

| Year | Demersal Species ^{1/} | Herring | Total |
|----------------|--|---------|---------|
| |(Metric Tons ^{2/})..... | | |
| 1963 | 127,600 | 10,900 | 138,500 |
| 1962 | 133,655 | 9,855 | 143,520 |

^{1/}Mostly cod, but also haddock, halibut, ling, plaice, saithe, tusk, porbeagle, Norway lobster, ocean perch (redfish), catfish, etc.
^{2/}Round, fresh weight.

Processing: WET-SALTED FISH: Total production of wet-salted fish in 1963 was down 7 percent from 1962. Only the production on the Icelandic grounds showed an increase over the previous year (table 2).

Table 2 - Faroese Production of Salted Fish,^{1/}
By Fishing Area, 1962-1963

| Year | Fishing Area | | | | Total |
|------|--------------|---------|------------------------------|---------------|--------|
| | Greenland | Iceland | Barents Sea (Metric Tons) | Faroe Islands | |
| 1963 | 2/33,375 | 1,594 | 311 | 856 | 36,136 |
| 1962 | 35,319 | 1,360 | 1,069 | 1,023 | 38,771 |

^{1/}Mostly cod. Does not include salted herring.
^{2/}Includes production from fish taken off Newfoundland.

DRY-SALTED FISH: Production of dry salted fish in 1963 was estimated at 8,000 tons, or 27 percent less than the 10,872 tons produced in 1962.

SALTED HERRING: The production of salted herring in 1963 amounted to 85,000 export barrels. This was well above the 64,000 barrels of 1962, but well under the 112,000 barrels produced in 1961 and 159,000 barrels in 1956. The net weight of an export barrel of herring is 145,147 kilos (320-324 pounds).

FROZEN FILLETS: The production of frozen fillets in 1963 amounted to about 4,100 tons as compared with 2,700 tons in 1962. The 1963 total includes 860 tons of saithe (coal-fish) fillets prepared for Hungary, East Germany, and Czechoslovakia. Nordafar, the Norwegian, Danish, and Faroese company operating at Faeringehavn, Greenland, produced about 2,100 tons of the 1963 total and about 1,600 tons of the 1962 quantity.

Exports: Faroese exports of fishery products in 1963 were up 8 percent in value from the previous year. (As usual, about 98 percent of total Faroese exports were fishery products.) Increases occurred only in wet-salted fish and frozen fillets (table 3).

Table 3 - Value of Total Faroese Exports of
Fishery Products, 1962-1963

| Commodity | 1963 | | 1962 | |
|-------------------------------------|-------------------|-----------------|-------------------|-----------------|
| | Million Kroner | Million US\$ | Million Kroner | Million US\$ |
| Wet-salted fish ^{1/} . . . | 53.2 | 7.7 | 35.6 | 5.2 |
| Dry-salted fish ^{1/} . . . | 31.5 | 4.6 | 36.0 | 5.2 |
| Salted herring | 11.7 | 1.7 | 15.8 | 2.3 |
| Iced fish | 19.4 | 2.8 | 22.1 | 3.2 |
| Frozen fish fillets . . . | 11.9 | 1.7 | 7.8 | 1.1 |
| Other fishery products . | 6.3 | 0.9 | 7.2 | 1.0 |
| Total | 134.0 | 19.4 | 124.5 | 18.0 |

^{1/}Does not include herring.

Year-End Stocks of Fish on Hand: Larger quantities of all major fishery commodities, except dry-salted fish, were in storage in the Faroe Islands at the end of 1963 than at the end of 1962. Relatively higher values for the stocks on December 31, 1963, indicated higher unit prices were expected (table 4).

Faroe Islands (Contd.):

Table 4 - Year-End Stocks of Fish in the Faroe Islands, 1962-1963

| Commodity | Dec. 31, 1963 | | | Dec. 31, 1962 | | |
|-------------------|---------------|-----------|------------|---------------|-----------|------------|
| | Qty. | Value | | Qty. | Value | |
| | Metric Tons | 1,000 Kr. | US\$ 1,000 | Metric Tons | 1,000 Kr. | US\$ 1,000 |
| Wet-salted fish | 3,600 | 10,000 | 1,449 | 2,492 | 3,300 | 478 |
| Dry-salted fish | 1,500 | 6,700 | 970 | 1,696 | 6,000 | 869 |
| Salted herring | 1,780 | 2,500 | 362 | 732 | 1,000 | 145 |
| Fillets | 155 | 500 | 72 | 125 | 300 | 43 |
| Total | 7,035 | 19,700 | 2,853 | 5,045 | 10,600 | 1,535 |

Fishing Vessels: During 1963, the Faroese fishing fleet gained 11 new fishing vessels, 3 of which were built in Faroese shipyards. In 1964, a total of 10 new fishing vessels are to be delivered. Five will have refrigerated cargo holds and one will be equipped with a power block for herring seining (table 5).

Table 5 - Faroese Fishing Vessels, By Tonnage Group, 1963

| Gross Registered Tons | Number of Vessels | Total Tonnage |
|-----------------------|-------------------|---------------|
| 20-100 | 99 | 6,023 |
| 100-200 | 34 | 5,022 |
| 200-300 | 35 | 8,939 |
| 300-400 | 12 | 3,824 |
| 400-500 | 3 | 1,291 |
| Above 500 | 12 | 9,523 |
| Total | 195 | 34,622 |

The trend in the Faroese fleet is toward steel long-liners and better equipped vessels. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 26, 1964.)

Note: Kroner (Danish) 6.90 equal US\$1.00.



France

INDUSTRY URGED TO INCREASE EXPORTS OF CANNED TUNA:

At a meeting of France's Tuna Committee in January 1964, it was decided to promote greater exports of French canned tuna. The Committee also decided to contribute funds for the promotion effort.

The demand for canned tuna in France has been very good and markets were expanded considerably during the past three years. Recently, the demand dropped to such a low level on a national scale as to cause some concern, and fears were expressed that the national consumption potential of canned tuna may have been overestimated.

Stocks of canned (yellowfin) tuna from the previous season's pack were ample at the beginning of 1964. As of early January 1964, tuna fishing was well in progress, with indications that the season's quota would be reached by the end of May. Also, canned tuna was being imported by France in sufficiently large quantities to further depress the market. It was also pointed out at the meeting that increasingly large supplies of canned salmon were available--a product competitive to tuna and expected to become even more competitive.

At the Tuna Committee meeting, emphasis was placed on increasing exports and that an attempt be made by industry for a substantial initial export shipment of canned tuna. (Le Marin, January 24, 1964.)



Greece

LANDINGS BY ATLANTIC FREEZER-TRAWLER FLEET, 1963:

The Greek fleet of freezer-trawlers fishing in Atlantic waters landed 18,613 metric tons of frozen fish in 1963 compared with 16,979 tons in 1962 and 14,500 tons in 1961. In spite of a decline in average landings by individual freezer-trawlers in both 1962 and 1963, the addition of new vessels to the freezer-trawler fleet resulted in an increase in total landings. The Greek fleet of freezer-trawlers was expanded from 13 vessels in 1961 to 17 vessels in 1962 and 22 vessels in 1963. Taking into consideration that the new trawlers added each year did not all start fishing at the first of the year, the average annual landings of frozen fish per vessel were determined to be 1,180 tons in 1961, but only 1,095 tons in 1962, and 990 tons in 1963. The reduction in average landings by 105 tons from 1962 to 1963 was estimated to mean an average loss of revenue per vessel of over 1 million drachmas (US\$33,333). The decline in average landings was said to be due to a drop in the catch off Mauritania in northwest Africa. (Alieia, January 1964.)

Notes: (1) Greek drachmas 30.00 equal US\$1.00.
 (2) See Commercial Fisheries Review, Dec. 1963 p. 63, April 1963 p. 52, Jan. 1963 p. 92.



Guatemala

SHRIMP INDUSTRY TRENDS IN CHAMPERICO:

The joint Guatemalan-Japanese fishing and fish processing venture located at Guatemala's Pacific Coast port of Champerico has 20 fishing vessels operating out of that port. Ten of the vessels are owned by the Guatemalan firm (owns and operates the packing plant) which is a party to the joint enterprise and the other 10 vessels are owned by a separate Guatemalan corporation (but with the same ownership as the Guatemalan firm party to the joint venture). The Guatemalan interests of the joint enterprise control 51 percent of the venture, and a Japanese fishing firm and a Japanese trading firm both control the remaining 49 percent.

In addition to their financial interest, the Japanese provide technical supervision for the entire operation and market the processed product. All of the fishing vessels are jointly manned by Japanese and Guatemalans. The Japanese hold the positions of captain and chief machinist, while the Guatemalans occupy the three lesser posts in the typical five-man vessel crew. Other Japanese personnel oversee the processing and administrative functions. The shrimp that are caught and processed are marketed in the United States by a large Japanese trading organization.

The fishing vessels normally make about one voyage every two weeks. The average biweekly catch appears to run between 5,000 and 7,000 pounds of heads-off shrimp per vessel, plus a few hundred pounds of finfish and spiny lobsters. It also appears that more fish than shrimp are actually caught, but they are not landed because of the relatively small local demand for finfish, nor can they be economically exported at this time. According to the Guatemalan company's officials, the greatest part of the shrimp catch is exported to the United States, with nearly 90 percent shipped to New York City, 5 percent to Miami, Fla., and the remaining 5 percent divided between other United States cities and the domestic market. The firm's representatives said that their shrimp were bringing good prices, according to size, on the New York City wholesale market and that prices f.o.b. Champerico ranged from 35 to 85 U.S. cents a pound. The frozen shrimp are usually shipped to the Atlantic Coast port of Matias de Galvez by refrigerated truck and from there transported to the United States by ship.

The packing plant at Champerico is modern and has extensive freezing, ice-making, and frozen cold-storage facilities. The shrimp arrive at the plant in the shell but headless, and are immediately sorted and sized by machine. Following the sizing operation, the shrimp are placed in boxes, weighed (five pounds is the standard unit), and sent to the packing section of the plant. The shrimp are then frozen and packed in 50-pound cartons for export.

The packing firm employs about 250 workers, including 40 Japanese. There are about 100 fishermen, and the remainder of the work force is engaged in fish processing. The only other major employer in Champerico is a Government-owned enterprise which operates all port services. The plant wage scales are comparable to wages paid in the food processing industry in Guatemala City despite the lower cost of living in the port city. The shrimp packers are paid on a piece-work basis and virtually all of the sorters and packers are women.

It was reported that the Guatemalan fishing firm has recently had its share of labor problems because of agitation to organize a union to consolidate labor operations of both the fishing firm's operations and those of the Champerico port authority. But the attempts to unionize failed.

Guatemala's Labor Ministry wishes to see the speedy replacement of Japanese personnel by Guatemalans on the fishing vessels, pointing out that the original agreement for the establishment of the company provides that the Japanese will train Guatemalans in all aspects of fishery operations. In this connection, the Ministry of Labor and the company jointly announced the establishment of a school to train Guatemalans as fishing vessel captains and machinists. The

school will be in Champerico and was scheduled to open on March 1 with an initial enrollment of 7 students.

The wage scale for mariners aboard the firm's fishing vessels is computed on the basis of the vessel's total catch classified as fish, lobster and shrimp, with the shrimp further broken down by quality--best, good, and fair. The firm's accounting records showed that the winch operators earn about Q51.00 (US\$51.00) a trip and the seamen about Q45.00 (\$45.00) a trip. In addition, they receive their food at no cost while working on the fishing vessel. The Japanese crew members, the Captain and the Chief Machinist, also receive a salary, the amount of which was not disclosed.

The wage scale for plant employees is: dockworkers Q.20 (20 U.S. cents) an hour; sorters Q.20 (20 cents) an hour; cold storage Q.50 (50 cents) an hour; packers Q.005 (1/2 cent) per box packed. The operating hours of the plant depend on the size of the catch, and factory employees normally work several hours overtime. Time-and-a-half is paid for all overtime. (United States Embassy, Guatemala, March 6, 1964.)

Notes: (1) 1.00 Guatemalan quetzales equals US\$1.00.

(2) See Commercial Fisheries Review, January 1964 p. 51; and May 1963 p. 64.



Iceland

HERRING PRICES, MARCH 1-JUNE 15, 1964:

The Icelandic State Fisheries Pricing Board has announced prices to be paid at processing plants for South and West Coast herring during March 1-June 15, 1964. Following is a comparison between 1964 and 1963 prices according to the utilization of the herring:

| Utilization | Mar. 1-June 15, 1964 | | Mar. 1-June 15, 1963 | |
|---|-------------------------|---------|-------------------------|---------|
| | I. Kr./Kilo | US¢/Lb. | I. Kr./Kilo | US¢/Lb. |
| Herring for salting | 1.42 | 1.50 | 1.60 | 1.69 |
| Herring for filleting | 1.12 | 1.18 | 1.20 | 1.26 |
| Iced herring for export | 1.40 | 1.48 | 1.20 | 1.26 |
| Herring fodder . . . | 1.00 | 1.05 | 0.95 | 1.00 |
| Frozen herring, 10 percent fat content (3-6 herring per kilo) | 1.60 | 1.69 | 1.75 | 1.84 |
| Herring for reduction | 0.67 | 0.71 | 0.70 | 0.74 |

Note: Iceland kronur 43.06 equal US\$1.00.

In 1964, prices were down for herring for salting and filleting, but the price of iced herring for export was above that in the previous year. (United States Embassy, Reykjavik, March 18, 1964.)

* * * * *

FROZEN FISH SOLD TO U.S.S.R.:

The Freezing Plants Corporation and the Fisheries Department of the Federation of Iceland Cooperatives contracted in early 1964 to supply the Soviet Union with 12,000 metric tons of south coast frozen herring and 15,000

Iceland (Contd.):

tons of frozen fish fillets, including cod, haddock, ocean catfish, coalfish, ling, and ocean perch. The same amounts were sold to the Soviet Union by Iceland in 1963. The price which will be received in 1964 for the whitefish and ocean perch fillets is £154 per metric ton (US\$0.195 per pound) compared to £149 per ton (\$0.189 per pound) in 1963. The price which will be received in 1964 for the herring will be £53 per ton (\$0.067 per pound), which is the same as the price in 1963. (United States Embassy, Reykjavik, March 4, 1964.)

FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-AUGUST 1963:

| Species | January - August | |
|--------------------------|---------------------------|----------------|
| | 1963 | 1962 |
| | (Metric Tons) | |
| Cod | 211,219 | 203,456 |
| Haddock | 35,064 | 30,557 |
| Saithe | 10,481 | 9,586 |
| Ling | 4,630 | 5,756 |
| Wolffish (catfish) | 12,423 | 12,595 |
| Cusk | 4,922 | 4,107 |
| Ocean perch | 26,005 | 10,217 |
| Halibut | 832 | 1,060 |
| Herring | 284,861 | 382,235 |
| Shrimp | 349 | 349 |
| Other | 10,268 | 9,234 |
| Total | 601,054 | 669,152 |

Note: Converted to whole ungutted fish regardless of how landed.

UTILIZATION OF FISHERY LANDINGS, JANUARY-AUGUST 1963:

| How Utilized | January - August | |
|--------------------------------------|---------------------------|----------------|
| | 1963 | 1962 |
| | (Metric Tons) | |
| <u>Herring</u> ^{1/} for: | | |
| Canning | 291 | 335 |
| Oil and meal | 188,673 | 301,201 |
| Freezing | 21,863 | 18,138 |
| Salting | 67,340 | 54,842 |
| Fresh on ice | 5,617 | 7,718 |
| <u>Groundfish</u> ^{2/} for: | | |
| Fresh on ice | 21,363 | 17,633 |
| Freezing and filleting .. | 141,785 | 132,118 |
| Salting | 68,354 | 84,070 |
| Stockfish (dried unsalted) | 66,971 | 39,418 |
| Canning | 35 | - |
| Home consumption | 9,910 | 9,069 |
| Oil and meal | 2,811 | 1,987 |
| <u>Capelin</u> for: | | |
| Freezing | 188 | - |
| Oil and meal | 889 | - |
| <u>Shrimp</u> for: | | |
| Freezing | 267 | 263 |
| Canning | 82 | 86 |
| <u>Lobsters</u> for: | | |
| Fresh on ice | 2 | - |
| Freezing | 4,613 | 2,274 |
| Total production | 601,054 | 669,152 |

1/Whole fish.

2/Drawn fish.

Source: Aeqir, December 15, 1963.

India

NEW SHRIMP-PROCESSING PLANT IN COCHIN:

The construction of a new fishery products processing and freezer plant on Vypeen Island, Cochin, Kerala, India, was completed in September 1963 and started operating in November. The new plant was built by a Cochin seafood firm in collaboration with a New York City fishery products marketing firm. The New York firm has agreed to buy the Cochin firm's entire exportable production of shrimp. The New York firm also financed the purchase of United States machinery and equipment for the freezing plant.

The plant is equipped with refrigerating machinery, tunnel, plate freezers, and other equipment used for freezing fishery products. It also has automatic washers, inspection belts, mechanical sorters and graders. Capable of handling about 100,000 pounds of shrimp a day, the plant has a storage capacity of over 40,000 pounds of packaged frozen fishery products, mostly shrimp. The Cochin company has set up a Diesel oil installation to supply fuel to the fishing vessels; built an ice plant with a 20-ton capacity to supply ice to the fishing vessels; and operates a fleet of insulated trucks.

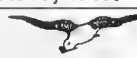


The firm operates 60 small mechanized trawlers which deliver their shrimp catches to three processing centers located in different areas within 20 miles of the main plant. When the shrimp is delivered to the main plant, it is mechanically washed, sorted, graded, weighed, packed, frozen, and stored for shipment. In order to provide an adequate supply of fresh clean water for washing and cleaning the shrimp, the company has bored a deep tube well of 300 feet at the plant site.

The company's production department is staffed with a team of qualified fishery technologists who have had several years practical experience in the packaging of frozen fishery products. A qualified and foreign-trained refrigeration engineer is in charge of the plant's refrigeration department, with a team of experienced refrigeration mechanics working under him.

It is estimated that if the plant were to operate at optimum capacity for ten months out of the year it would achieve a production of about 12 million pounds with a foreign exchange value of Rs.50 million (US\$10.4 million), making it the largest freezer plant in India. The company is reported to have applied for a license to import two large trawlers at a cost of about \$85,000 each to carry out offshore and deep-sea trawling operations year-round.

India's exports of frozen shrimp from Cochin have increased greatly mainly because of the rich shrimp fishing grounds of the Cochin maritime area. Shrimp are normally caught in the area's coastal waters in about 6 to 10 fathoms by local vessels which operate up to a distance of 5 to 10 miles from shore. Different types of fishing gear are used for catching shrimp, the most widely used being the drag net. In the past five years, mechanized vessels and small trawlers have



India (Contd.):

been added to the local fleet which now numbers about 400. Cochin is regarded as the pioneer of India's frozen shrimp industry with more than 15 packers now operating in that area.



Italy

TUNA INDUSTRY TRENDS:

There are about 35 tuna canneries in Italy. They include plants which specialize in packing only tuna, as well as plants which pack other foodstuffs. Their combined daily processing capacity is estimated to total 380-400 metric tons of tuna.

The smaller plants can process daily about two metric tons of tuna, the medium plants about eight tons, and the large plants about 30 tons. Some of those plants are now reported to be expanding their production facilities.

The majority of the tuna plants are located in the Venice area, followed closely by Trapani and Palermo in Sicily. At Gaeta (between Rome and Naples) a new plant, financed partly by a large United States tuna packer, has been established. That United States firm is also helping finance the construction of another plant (now under construction) at Olbia, Sardinia.

The existing facilities at Olbia consist of a cannery capable of processing about five metric tons of tuna per day and a 300-ton capacity cold-storage plant. Upon completion of the new facilities, the packing plant will be able to process 20-30 metric tons of tuna per day, and the cold-storage plant will be able to hold 2,000 metric tons of frozen tuna.

Some of the Italian tuna plants operate their own cold-storage facilities. Their combined total cold-storage capacity is estimated at 7,000-8,000 metric tons. Other noncannery-operated cold-storage facilities (located mainly at the different seaports) utilized for holding tuna are estimated to have a combined total holding capacity of about 10,000 metric tons. The monthly cold-storage fees of those noncannery-operated plants range from 1,500-3,000 lira (US\$2.41-4.83) per metric ton.

Italians do not like big-eyed tuna due to the dark color of the meat. However, they are purchasing big-eyed tuna in mixed lots with yellowfin, which they like most. They are said to be beginning to utilize big-eyed tuna more and more, although at a slow rate.

Italy imports frozen tuna principally from Japan and to a lesser extent from other countries, such as Norway, Spain, and Turkey. In 1961, Italy imported approximately 29,000 metric tons of Japanese frozen tuna, and in 1962 about 32,400 metric tons. From Norway Italy imported 3,000 metric tons of bluefin in 1961, and another 2,000 metric tons in 1962.

Small quantities of Spanish skipjack (averaging about five pounds each) are imported into Italy. However, they are reported as being inferior in quality to the Japanese product. In 1961, Italy imported about 2,000 metric tons of skipjack from Turkey and Peru, but due to their small size, lower yield, and the fluctuating nature of the skipjack fisheries in general, Italian packers are reported not to be placing too much reliance on those countries as sources of tuna supply. (Nihon Suisan Shimbun, January 1, 1964.)

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EXPANSION OF TUNA OPERATIONS PLANNED:

A large Italian commercial combine, through its subsidiary fishery firm, is re-

ported to be planning on expanding its tuna operations and is desirous of working out an agreement with Japan. Reportedly, the Italian firm hopes to construct a 1,000- to 1,500-ton portable-boat-carrying tuna mothership. The crew for the mothership, as well as fishing gear, would be provided by Japan.

A Japanese fishing company has been approached, and that company, in turn, has submitted an application to the Japanese Fisheries Agency to participate in the Italian enterprise.

Reportedly, the Italian commercial combine is presently negotiating with the Italian Government for financial assistance to construct the tuna mothership, and the Italian combine plans to put up 30 percent of the construction cost and is seeking a low-interest loan for the remaining 70 percent. (Suisan Tsushin, February 6, 1964.)

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JOINT JAPANESE-ITALIAN TUNA ENTERPRISE PROPOSED:

A proposed joint Japanese-Italian tuna enterprise involves a Japanese company and is actually being supported by an Italian businessman with Swiss connections.

The joint enterprise is to be established with a capital of 100 million lira (US\$161,000), with each participant contributing an equal share. In the initial year of operation, the Japanese firm would export to Italy one or two large tuna vessels, which would be operated by a Japanese crew. Eventually, the fleet would be expanded to 10 tuna vessels in the 1,000-ton class, which would be exported to Italy from Japan. (Suisancho Nippo, February 27, 1964.)

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PRICES PAID FOR JAPANESE FROZEN TUNA:

Japanese landings of Atlantic Ocean frozen tuna for export to Italy were reported to be averaging about 4,000 metric tons a month. Since the Italian tuna market is considered able to consume at the present time only about 40,000 metric tons of imported tuna annually, some concern is being expressed by Japanese trading firms over what presently appears to be an imbalance in supply and demand. Reportedly, this has resulted in a slight weakening of the Italian tuna market.

Italy (Contd.):

Towards mid-February 1964, the price of frozen yellowfin (dressed with tail) exported to Italy was holding at US\$410 a metric ton c. & f., but dressed big-eyed was quoted at \$340-360 per metric ton c. & f., down slightly. (Suisan Tsushin, February 22, 1964.)

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IMPORT CURBS BEING STUDIED:

According to information received in Japan, the Italian Government, faced with a deteriorating foreign exchange situation, is planning on restricting foreign imports. Should controls be extended to imports of fishery products, they are expected to greatly affect Japanese tuna trade with Italy. However, Japanese trading firms are of the opinion that the Italian Government may not impose trade restraints on the importation of frozen tuna but will likely impose restrictions on the importation of canned tuna. (Suisancho Nippo, February 3, 14, and 21, 1964.)

* * * * *

NO INCREASE IN DUTY-FREE FROZEN TUNA IMPORT QUOTA:

In 1963, the Italian tuna industry requested the Italian Government to increase to 60,000 metric tons the quantity of frozen tuna that could be imported into Italy on a duty-free basis. However, due to the deteriorating foreign exchange situation in that country, informed Japanese observers believe that it is unlikely that the hoped-for increase will be granted. It is likely the quantity of frozen tuna that Italy will allow to be brought in on a duty-free basis will be held to 40,000 metric tons, as before. (Nihon Suisan Shimbun, February 24, 1964.)

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JAPANESE FROZEN TUNA REJECTS REPORTED:

Sizable quantities of Japanese-caught Atlantic Ocean big-eyed tuna exported to Italy were rejected by Italian packers in February 1964, reportedly due to a dark meat condition. The Italian packers not only rejected whole shipments of big-eyed but demanded a reduction in prices ranging from 20-40 percent. They are also considering sending a delegation to Japan this summer. Japanese trading firms believe that the Italian delegation will attempt to capitalize on the present big-eyed

quality problem and seek to conclude a standard supply contract during its visit to Japan. (Suisancho Nippo, March 5, 1964.)

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JAPAN PROPOSES TO PARTICIPATE IN CANNED TUNA PROMOTION PROGRAM:

In response to the request made by the Italian tuna industry to assist in the promotion of canned tuna sales in Italy, the Italian Subcommittee of the Japan Frozen Foods Exporters Association, at a meeting on March 2, 1964, in Japan to study the Italian request, drafted a proposal to contribute 6 million yen (US\$16,667) for the promotion of canned tuna in Italy. Of that sum, the Japanese Government would be asked to contribute half, and industry's contribution would be equally shared between exporters and producers.

The draft proposal was scheduled to be taken up for study at the executive session of the Exporters Association. (Suisan Tsushin, March 4, 1964.)

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PROJECT TO TAG YOUNG TUNA INITIATED IN SICILY:

A project for tagging young bluefin and albacore tuna (Thunnus thynnus L. and Germo alalunga) in a zone between the Baltic Gulf and the Aeolian Islands was recently undertaken by the Experimental Center for the Fishing Industry and Marine Products at Messina (Sicily), Italy. The project was initiated by the Italian Directorate for Fisheries based on recommendations made by the General Fisheries Council for the Mediterranean and the Biology Branch of the Food and Agriculture Organization (FAO).

A total of 25 bluefin tuna 32 to 36 centimeters (12.6 to 14.2 inches) long, and 10 albacore tuna 28 to 32 centimeters (11.0 to 12.6 inches) long were tagged at the time the project was started.

The tag is described as a "spaghetti-type" tag made of yellow plastic, is about 8 inches long, and is attached on to the back of the fish. Fishermen who catch the tagged fish are requested to return the tag to the Experimental Center in Messina with information on the exact location where the fish was caught, size, weight, and any other pertinent details.



Japan

FROZEN TUNA EXPORT QUOTA FOR UNITED STATES:

The Japan Frozen Foods Exporters Association, at a meeting on February 27, 1964, tentatively agreed to set the fiscal year 1964 (April 1964-March 1965) export quota of frozen tuna to be shipped from Japan proper to the United States at 66,500 short tons, consisting of 24,000 tons of albacore, 36,000 tons of yellowfin, and 6,500 tons of tuna loins. (Suisancho Nippo, February 28, 1964.)

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FROZEN TUNA EXPORT QUOTAS FOR FY 1964:

The Japan Export Frozen Tuna Producers Association, at a special general meeting on March 10, 1964, approved frozen tuna export quotas for fiscal year 1964 (April 1964-March 1965):

1. Exports to the United States from Japan proper--24,000 short tons of albacore, 36,000 short tons of yellowfin, plus an adjustment quota of 15,000 short tons.
2. Indian Ocean transshipments to the United States--4,000 short tons.
3. Atlantic Ocean transshipments to the United States--120 vessel trips (equal to about 35,000 short tons).
4. Exports of Italy--43,000 metric tons.
5. Tuna loins for export to the United States--6,500 short tons.

Also at the March 10 meeting the Association approved the establishment of the Overseas Base Committee (composed of representatives from the three largest fishing companies) and, at the same time, allotted a frozen tuna export quota of 6,000 short tons for overseas bases. (Nihon Suisan Shimibun, March 13, 1964.)

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ATLANTIC FROZEN TUNA EXPORT PRICES:

Prices in mid-March 1964 of Japanese-caught Atlantic Ocean tuna exported to the United States and Italy, according to Suisan Tsushin, March 24, 1964, were:

To United States (f.o.b. Las Palmas):
Albacore (frozen round) - US\$330-335
a short ton.

To Italy (c.i.f. Italy):
Yellowfin (dressed with tail) - \$405-410
a metric ton.
Bluefin (dressed with tail) - \$380-385 a
metric ton.

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EXPORT PRICES FOR FROZEN ATLANTIC TUNA:

The price (f.o.b. Las Palmas, Canary Islands), of Japanese-caught Atlantic Ocean frozen tuna exported to the United States is reported as follows as of February 1964: round albacore US\$335 a short ton; gilled-and-gutted yellowfin \$310-335 a short ton. (Suisan Tsushin, February 22, 1964.)

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THIRD SALE OF CANNED TUNA TO UNITED STATES:

The Japan Canned Foods Exporters Association met on February 25, 1964, to discuss the third sale of canned tuna in brine to the United States. It agreed to export a total of 160,000 cases, consisting of 120,000 cases of white meat tuna and 40,000 cases of light meat tuna, for the third sale. Including the first two sales, this makes a total of 460,000 cases to be released for export to the United States. However, of that amount, only 160,000-170,000 cases are estimated to have been shipped as of the beginning of March. (Suisancho Nippo, February 28; Suisan Tsushin, March 3, 1964.)

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VALUE OF FROZEN AND CANNED TUNA EXPORTS, DECEMBER 1963 AND YEAR 1963:

Japan's exports of frozen tuna to the United States in December 1963 were valued at US\$1.4 million and exports of canned tuna at \$0.7 million. The United States took 27.9 percent of Japan's total frozen tuna exports in that month and 47.8 percent of the total canned tuna exports.

Value of Japan's Exports of Selected Fishery Products, 1962-1963

| Product | Year 1963 | | | Year 1962 | | |
|------------------|--------------------------|--------|------------|--------------------------|--------|------------|
| | To U.S. | Total | U.S. Share | To U.S. | Total | U.S. Share |
| Tuna, frozen . . | (In US\$1,000) 17,575 | 46,158 | % 38.1 | (In US\$1,000) 32,269 | 55,399 | % 58.2 |
| Tuna, canned . . | 14,263 | 22,721 | 62.8 | 12,869 | 19,591 | 65.7 |

Note: Exports are value f.o.b. Japan.
Source: Customs Bureau, Japanese Ministry of Finance.

Japan (Contd.):

Exports of frozen tuna from Japan to the United States in 1963 were down 45.5 percent in value as compared with the previous year. For the same year, the export value of canned tuna increased 10.8 percent.

The United States took 38.1 percent of Japan's total frozen tuna exports in 1963 as compared with 58.2 percent in 1962. The United States' share of Japan's total canned tuna exports in 1963 was 62.8 percent as against the previous year's 65.7 percent. (United States Embassy, Tokyo, February 14, 1964.)

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EXPORTS OF CANNED TUNA IN OIL, APRIL-DECEMBER 1962-1963:

Data compiled by the Japan Tuna Packers Association indicate that canned tuna in oil approved for export by that Association for the period April-December 1963 totaled over

| Japanese Exports of Canned Tuna in Oil by Country of Destination, April-December 1962-1963 | | |
|--|--------------------------------|-----------|
| Country of Destination | April-December | |
| | 1963 | 1962 |
| | (Actual Cases) | |
| West Germany | 530,702 | 384,500 |
| Canada | 175,958 | 161,354 |
| United Kingdom | 144,818 | 62,137 |
| Switzerland | 101,779 | 88,925 |
| Netherlands | 78,816 | 71,232 |
| Belgium | 73,311 | 67,878 |
| Lebanon | 80,877 | 38,817 |
| Aden | 63,266 | 20,803 |
| Others | 259,554 | 125,649 |
| Total | 1,509,081 | 1,021,295 |

1.5 million actual cases, a 50-percent increase over the same period in 1962. (Suisan Tsushin, February 1, 1964.)

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FISCAL YEAR 1964 EXPORT TARGET FOR FISHERY PRODUCTS:

The Japanese Ministry of International Trade and Industry, at a meeting on March

| Japanese Marine Products Export Target for FY 1964 | | |
|--|-----------------------------|---------|
| Commodity | FY 1964 | FY 1963 |
| | (US\$1,000) | |
| Frozen: | | |
| Tuna | 61,627 | 57,184 |
| Swordfish | 4,320 | 5,700 |
| Shrimp | 2,174 | 3,200 |
| Salmon | 1,940 | 2,000 |
| Rainbow trout | 1,415 | 1,080 |
| Others | 13,530 | 11,250 |
| Subtotal | 85,006 | 80,414 |
| Other Products: | | |
| Cultivated pearls | 51,300 | 41,200 |
| Fresh tuna & tunalike fish . . | 16,095 | 10,000 |
| Agar-agar | 1,260 | 1,900 |
| Salted & dried marine products | 5,800 | 6,000 |
| Subtotal | 74,455 | 59,100 |
| Grand total | 159,461 | 139,514 |

13, 1964, set the fiscal year 1964 (April 1964-March 1965) export target for marine products at US\$159.5 million, an increase of 14.3 percent over the 1963 target of \$139.5 million. (Suisan Keizai Shimbun, March 15, 1964.)

* * * * *

ALLOCATION PLANNED OF OVERSEAS BASES TUNA EXPORT QUOTA:

The Japan Frozen Foods Exporters Association has under consideration a plan whereby member firms would contribute to the Association 10 percent of their overseas base export quota. The contributed 10 percent would then be pooled and be distributed to those exporting firms which do not have an overseas base export quota or reallocated to those firms which have consumed their base export quotas and wish to export additional quantities of tuna.

Overseas bases that will be affected by this plan, if adopted, are American Samoa (export quota 27,000 short tons), Santo, New Hebrides (6,000 short tons), Penang, Malaysia (6,000 short tons), and Noumea, New Caledonia (7,500 short tons). (Suisancho Nippo, February 13, 1964, and other sources.)

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TUNA INDUSTRY ORGANIZATIONS SEEK TO IMPROVE THEIR MANAGEMENT:

The Steering Committee of the Japan Frozen Tuna Sales Company met on March 5, 1964, to discuss ways in which the operational costs of the Sales Company could be reduced, as requested by the tuna producers providing financial support to that organization. The Committee, unable to arrive at any definite conclusion at that meeting, has scheduled a second meeting.

It was suggested at the March 5 meeting that the most logical way to improve management was to consolidate the business affairs of the Sales Company, which handles the sale of frozen tuna consigned to it by the Export Frozen Tuna Producers Association. The annual operating expense of the Producers Association is 18 million yen (US\$50,000) and that of the Sales Company 20 million yen (\$55,555)--total 38 million yen (\$105,555). Some producers want the total combined expenditures for those two organizations kept below the 30-million-yen (\$83,333) level.

On March 10, the Export Frozen Tuna Producers Association convened a special general

Japan (Contd.):

meeting to discuss business plans for fiscal year 1964 (April 1964-March 1965). It was decided at that meeting to establish a liaison committee to coordinate the plans and activities of the five committees (Atlantic Ocean, Indian Ocean, Transshipment, Direct Shipment, and Loin Committees), with each committee to have equal representation on the Liaison Committee.

At that meeting also, the Chairman announced his support for the recommendation to reduce the operational costs of the Frozen Tuna Sales Company and pointed to the need for conducting a comprehensive review for the purpose of developing a rational management policy for the frozen tuna industry. (Suisan Tsushin, March 6 & 11, 1964.)

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TUNA MOTHERSHIP RETURNS FROM EASTERN PACIFIC:

The Japanese portable-boat-carrying tuna mothership Keiyo Maru (3,700 gross tons) returned to Tokyo on February 13, 1964, after being out at sea for 8 months. The mothership carried eight 20-ton portable boats, and operated in the eastern Pacific Ocean (mainly in the area between longitudes 81° W. and 133° W. and south of the equator to 23° S. latitude).

The Keiyo Maru landed a total of 1,880 metric tons of fish: 260 tons of yellowfin (14 percent); 211 tons of albacore (11 percent); 622 tons of big-eyed (33 percent); 330 tons of spearfish (18 percent); and 457 tons of sharks and other miscellaneous fish (24 percent). The eight portable boats, fishing with long lines, averaged 1.652 metric tons of fish per set. (Hokkai Shimibun, February 3; Suisancho Nippo, February 17, 1964.)

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HALIBUT VESSELS LICENSED FOR TRIANGLE AREA OF EASTERN BERING SEA:

The Japanese Fisheries Agency has licensed 1 mothership and 7 long-line vessels to operate in the halibut fishery in Area 3B North Triangle of the Eastern Bering Sea, which was scheduled to open March 25, 1964. Seven additional Japanese vessels were expected to be licensed to fish for halibut in that area if the over-all area quota of 6,393,340 pounds was not attained by United

States, Canadian, and Japanese vessels by late April 1964. (United States Embassy, Tokyo, March 10, 1964.)

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TRAWLERS LICENSED TO FISH EASTERN NORTH PACIFIC:

On February 28, 1964, the Japanese Fisheries Agency announced that it would license a total of six trawlers to fish on an experimental basis in the eastern North Pacific in 1964. One trawler would be licensed to operate on a year-round basis, while the other five trawlers would be licensed to operate for a seven-months period, beginning April 1. Six fishery firms are involved with one trawler each.

The fishing vessels are: Akebono Maru No. 51 (1,470 gross tons), Tenryu Maru (545 gross tons), Taiyo Maru No. 81 (2,800 gross tons), Taiyo Maru No. 76 (2,150 gross tons), Daishin Maru No. 15 (1,500 gross tons), and Kohoku Maru (290 gross tons).

Japanese stern-trawler Akebono Maru No. 51.

The stern trawler Akebono Maru is the one licensed to operate on a year-round basis. Three of the firms are being licensed to operate trawlers in the Gulf of Alaska waters for the first time this year. On the other hand, the Fisheries Agency rejected the application submitted by another firm to operate a trawler in the Gulf in 1964, rather than a long-liner as in 1963. That firm operated the bottomfish long-liner Seiju Maru last year, and was reported to have suffered considerable financial loss.

In addition to licensing three more trawlers than in 1963, the Agency extended the area of operation to the west by five degrees and to the east by 10 degrees. The 1964 area of operation includes the waters north of 50° N. latitude (same as in 1963) between west longitudes 175° (in 1963 170°) and 135° (in 1963

Japan (Contd.):

145°). The Agency is also permitting ship-to-ship transfer of catches at sea to increase operating efficiency. (Suisan Keizai Shimbun, February 29, 1964.)

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EASTERN BERING SEA BOTTOMFISH FISHING FLEETS FOR 1964 SEASON ANNOUNCED:

According to the Japanese Fisheries Agency, 14 mother-ships and 228 catcher vessels are authorized to operate in the bottomfish fishery in the Eastern Bering Sea during the 1964 season. This is a reduction in fleet size of 5 motherships and 17 catcher vessels operated in the 1963 season.

As of February 19, 1964, only one mothership, the Chichibu-Maru and its 12 catcher vessels had been licensed for operation in the Bering Sea area. The Chichibu-Maru, owned and operated by one of Japan's larger fishing companies, is authorized to conduct its fishing operations in waters south-west of a line drawn from Cape Navarin (Siberia) to Cape Sarichef (Unimak Island, Alaska) for the period February 1, 1964, to January 31, 1965. Of the 12 catcher vessels accompanying the Chichibu-Maru 10 will operate otter trawls and 2 will use Danish seines. Fishing operations will be primarily centered

on catching shrimp but ocean perch and herring are included as a part of the production goal of the fleet.

The Chichibu-Maru is equipped with a one-line shrimp cannery capable of canning 2,000 cases (48 7-oz. cans per case) daily and a freezing plant capacity of handling 150 metric tons of fish and shellfish a day. The catch target or production goal is reported to be 350,000 cases of canned shrimp, 10,300 tons of frozen shrimp, 1,900 tons of frozen ocean perch, and 200 tons of frozen herring. Two trips are planned to the fishing grounds, one for the period February 1 to July 15, and the second from August 15 to December 31.



Fig. 1 - A Japanese mothership Einin Maru.



Fig. 2 - Japanese mothership Hoyo Maru (formerly the Renshin Maru).

Table 1 - Japanese Bering Sea Bottomfish Fishery Mothership Fleet, 1964^{1/}

| Name of Mothership | Catcher Vessels ^{2/} | | | | | Total Catcher Vessels |
|---|-------------------------------|-------------|--------------|--------------|---------------------|-----------------------|
| | Gross Tonnage | Otter Trawl | Paired Trawl | Danish Seine | Long line & Gillnet | |
| <u>Gyokuei-Mar</u> u . . . | 10,357 | - | 11 | 19 | - | 30 |
| <u>Ibuki-Mar</u> u | 2,502 | - | - | 1 | - | 1 |
| <u>Shikishima-Mar</u> u | 10,144 | - | 2 | 22 | - | 24 |
| #2 <u>Chichibu-Mar</u> u | 1,693 | 2 | 6 | - | - | 8 |
| <u>Einin-Mar</u> u | 7,482 | 1 | 14 | - | - | 15 |
| No. 82 <u>Taiyo-Mar</u> u | 2,840 | 1 | - | - | - | 1 |
| <u>Soyo-Mar</u> u | 11,192 | 2 | 12 | 14 | - | 28 |
| <u>Tenyo-Mar</u> u | 11,581 | 1 | 5 | 22 | - | 28 |
| <u>Hoyo-Mar</u> u (formerly <u>Renshin-Mar</u> u) | 14,094 | - | 14 | 16 | - | 30 |
| <u>Seifu-Mar</u> u | 8,269 | - | - | 13 | 15 | 28 |
| <u>Itsukushima-Mar</u> u | 5,871 | - | - | 9 | 9 | 18 |
| <u>Tone-Mar</u> u | 535 | - | - | - | 2 | 2 |
| No. 15 <u>Kotoshiro-Mar</u> u | 701 | - | - | - | 3 | 3 |
| Total motherships (13) | | | | | | |
| Total catcher vessels | | 7 | 64 | 116 | 29 | 216 |

^{1/}The mothership Chichibu-Maru and 12 catcher vessels shown in table 2.
^{2/}Number of catcher vessels subject to change.

Table 2 - Composition of Chichibu-Maru Fleet to Operate in 1964 Bering Sea Bottomfish Fishery

| Name of Vessel | Gross Tonnage | Type of Vessel | Area of Operation |
|---------------------------------------|---------------|------------------------|-------------------------------------|
| <u>Chichibu Mar</u> u | 7,421 | Mothership | S.W. Cape Navarin and Cape Sarichef |
| No. 50 <u>Nisshin-Mar</u> u | 263 | Otter Trawler | " |
| No. 51 <u>Nisshin-Mar</u> u | 263 | " | " |
| No. 52 " " | 263 | " | " |
| No. 53 " " | 266 | " | " |
| No. 55 " " | 265 | " | " |
| No. 56 " " | 265 | " | " |
| <u>Yohko-Mar</u> u | 341 | " | " |
| <u>Shoko-Mar</u> u | 315 | " | " |
| No. 3 <u>Akebono-Mar</u> u | 343 | " | " |
| No. 10 <u>Akitsu-Mar</u> u | 337 | Long-liner-Gill-netter | " |
| No. 17 <u>Myojin-Mar</u> u | 100 | Danish Seiner | " |
| <u>Gyoan-Mar</u> u | 84 | Danish Seiner | " |

Six Japanese motherships (accompanied by 138 catcher vessels) of the 14 authorized to operate in the Eastern Bering Sea bottomfish fishery were scheduled to depart in April 1964 for the fishing grounds. They were the Tenyo Maru (11,581 gross tons) departing April 8; Gyokuei Maru (10,537 gross tons), April 10; Einin Maru (7,482 gross tons), April 15; Hoyo Maru (formerly the Renshin Maru 14,094 gross tons), April 23; Tone Maru (535 gross tons), mid-April; and the Seifu Maru (8,269 gross tons), late April. (Fisheries Attache, United States Embassy, Tokyo, February 28, 1964, and Suisancho Nippo, March 23, 1964.)

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TWO MOTHERSHIPS ISSUED LICENSES FOR 1964 KING CRAB OPERATIONS IN EASTERN BERING SEA:

The Japanese Fisheries Agency issued licenses to nine Japanese fishing companies to process (can) king crab in the Eastern Bering Sea during the 1964 season. Four of the firms will carry out joint canning operations on the factory-ship Tokei-Maru (5,385 gross tons) and the remaining 5 companies will process their catch on the Dainichi-Maru (5,859 gross tons). The combined production quota for the two fleets was set at the 1963 level of 235,000 cases (48 - #1/2 cans per case) of which 120,000 cases were allocated to

Japan (Contd.):

the Tokei-Maru fleet and 115,000 cases to the Dainichi-Maru fleet.

The two factoryships sailed from Hakodate on March 1. The Tokei-Maru has an attached fleet of 8 Kawasaki vessels (portable launch-type vessels or skiffs) and 6 catcher boats and the Dainichi-Maru is accompanied by a fleet of 9 Kawasaki vessels and 6 catcher boats.

| Japan's King Crab Mothership Fleet Licensed to Operate in Eastern Bering Sea in 1964 | | |
|--|------------|----------------|
| Name of Vessel | Gross Tons | Type of Vessel |
| Tokei-Maru Fleet: | | |
| <u>Tokei-Maru</u> | 5,385.6 | Mothership |
| <u>Kawasaii</u> No. 1 | 8.6 | Skiff |
| " No. 2 | 8.4 | " |
| " No. 3 | 8.7 | " |
| " No. 5 | 8.4 | " |
| " No. 7 | 8.9 | " |
| " No. 8 | 8.6 | " |
| " No. 10 | 8.9 | " |
| " No. 11 | 8.9 | " |
| <u>Kogyo-Maru</u> No. 7 | 84.3 | Catcher Boat |
| (Unknown) | 84.6 | " |
| <u>Taihei-Maru</u> No. 8 | 75.0 | " |
| <u>Kaiun-Maru</u> No. 18 | 73.9 | " |
| <u>Choei-Maru</u> No. 3 | 81.7 | " |
| <u>Meiji-Maru</u> No. 1 | 84.9 | " |
| Dainichi-Maru Fleet: | | |
| <u>Dainichi-Maru</u> | 5,859.1 | Mothership |
| <u>Kawasaki</u> No. 1 | 9.8 | Skiff |
| " No. 2 | 9.7 | " |
| " No. 3 | 9.8 | " |
| " No. 5 | 9.7 | " |
| " No. 7 | 10.1 | " |
| " No. 8 | 10.1 | " |
| " No. 10 | 10.2 | " |
| " No. 11 | 9.0 | " |
| " No. 12 | 8.2 | " |
| <u>Kanemoto-Maru</u> No. 10 | 84.7 | Catcher Boat |
| <u>Oshima-Maru</u> No. 11 | 84.9 | " |
| <u>Daikame-Maru</u> No. 2 | 82.1 | " |
| <u>Matsuma-Maru</u> No. 8 | 83.1 | " |
| <u>Mutsumi-Maru</u> No. 28 | 72.5 | " |
| <u>Shunsho-Maru</u> No. 25 | 84.8 | " |

The 1964 season operations were licensed for the period March 1 to December 31, 1964. However, it is anticipated that the quota will be attained before the expiration date of the licenses. (Fisheries Attache, United States Embassy, Tokyo, March 10, 1964.)

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STERN-TRAWLING OPERATIONS:

The President of a large Japanese fishing company, at a news interview held on February 17, 1964, at Shimonoseki, announced that his firm is constructing two 3,500-ton stern trawlers, which are expected to be completed in June 1964. They are scheduled to fish in the Eastern Bering Sea. At the same time, one of the two 1,500-ton stern trawlers presently assigned to the Bering Sea will be transferred to the trawling grounds off Africa. Thus, under this plan the firm will have 3 large stern trawlers operating in the Eastern Bering Sea and 3 more in the Atlantic Ocean. At the present time, the 1,500-ton stern trawl-

ers Akebono Maru Nos. 51 and 52 are assigned to the Bering Sea and Nos. 50 and 53 to the Atlantic Ocean. (Nihon Suisan Shimbun, February 21, 1964, and other sources.)

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LONG-LINE FLEETS PLAN TO FISH BOTTOMFISH SOUTH OF WESTERN ALEUTIAN ISLANDS IN FALL 1964:

The Japanese Fisheries Agency reportedly plans to license 2 or 3 long-line fleets to fish on an experimental basis for bottomfish in the waters south of the western Aleutian Islands in fall of 1964. It is expected that the two companies involved will submit applications to operate bottomfish long-line fleets in those waters. Those same two firms had operated vessels north of the western Aleutian Islands in 1963 and are the only companies having operated vessels near the waters which the Agency plans to open up to experimental fishing.

One firm is expected to use the mothership Shikishima Maru (5,871 gross tons) and the other firm the mothership Seifu Maru (8,269 gross tons) for the fall bottomfish long-line operation.

The fleets would be licensed to operate for a four-month period, beginning in September 1964 (after the end of the salmon fishing season). The Agency expected to announce its findings by May. (Suisancho Nippo, February 20, and 24, 1964.)

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BOTTOMFISH FISHING OFF NEW ZEALAND:

Japanese fishing companies and fishing vessel operators are showing increasing interest in the bottom long-line sea bream fishery off North Island, New Zealand. Even tuna vessels operating in the waters nearby New Zealand are engaging in that fishery. One such vessel is the 420-ton Umigata Maru No. 8, which temporarily switched to fishing for sea bream in late 1963 due to poor tuna fishing. That vessel was fishing for bottomfish with four unpowered boats, and catching an average of about 5 tons of fish a day.

One small Japanese firm planned on sending the 1,184-ton freezer carrier Seiju Maru No. 3, deck-loaded with 10 small boats, to the New Zealand waters. Several other vessels are also outfitting for that fishery.

Japan (Contd.):

As of late February, the Fisheries Agency had received about 30 applications from groups interested in engaging in the New Zealand bottom long-line fishery. However, many of the applications are believed to have been submitted merely for the purpose of establishing "rights," should the Agency decide to place that fishery under a licensing system.

Following the influx of Japanese fishing vessels to the waters off New Zealand, the New Zealand Government has contacted the Japanese Government concerning violations of New Zealand's territorial waters committed by Japanese vessels. The Japanese Government has issued stern warnings to its fishermen concerning this infraction. The Japanese Government is also considering placing the New Zealand bottomfish fishery under a licensing system, beginning in 1965. (Suisan Tsushin, February 18 & 24; Minato Shimbun, February 4, 1964.)

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JAPANESE SHIPYARD LAUNCHES FIRST OF FIVE TUNA FACTORY-MOTHERSHIPS ORDERED BY U.S.S.R.:

On January 29, 1964, a Japanese shipyard held a launching ceremony at its Mukojima dockyard for a 5,000-gross-ton tuna factory-mothership, which is the first of 5 such vessels ordered in May 1963 by the Soviet Ship Import Association. Priced at about 1.3 billion yen (US\$3.6 million), the newly launched vessel is scheduled for completion at the end of June 1964. Another tuna mothership was scheduled to be launched in mid-April. It is further scheduled that the remaining 3 tuna motherships for the U.S.S.R. will be launched during 1964 at the end of June, in mid-September, and in mid-December. Delivery of all the 5 vessels will be made by the end of March 1965.

The new mothership, named Leninskiy Luchi, will carry six 22-ton catcher vessels and will be capable of remaining at sea for periods ranging up to 7 months. It will be equipped with tuna processing and canning equipment, quick-freezing equipment, and oil manufacturing equipment.

Specifications of the new factory-mothership are as follows: length, 115 meters (377 feet); width, 17.4 meters (57 feet); depth 8.8

meters (28.9 feet); draft, 5.5 meters (21.3 feet); main Diesel engine, 3,450 hp.; and speed, 14 knots. (Nihon Kogyo Shimbun, February 2, 1964.)

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TRAWLERS TO BE EXPORTED TO GHANA:

A Japanese fishing company concluded final arrangements for delivery to the Ghanaian Government Fisheries Corporation of twelve 1,800-ton stern trawlers, the export of which was approved by the Japanese Government in 1963. The trawlers are to be delivered to Ghana according to the following schedule: 1964, two trawlers; 1965, three trawlers; 1966, three trawlers; and 1967, four trawlers.

Another Japanese fishing company is said to be proceeding with plans to export a large trawler to Ghana, and has already completed preliminary negotiations with a Ghanaian private citizen of considerable wealth. Reportedly, the Japanese firm plans to export to Ghana a 1,500-ton stern trawler, and would assist in the operation and maintenance of that vessel. (Suisan Nippo, February 28 & March 2, 1964.)

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SKIPJACK TUNA PURSE-SEINING TEST OFF PHILIPPINES PROPOSED:

A large Japanese fishing company submitted a petition to the Fisheries Agency requesting that it be permitted to conduct experimental purse-seine fishing for skipjack tuna south of the Philippine Islands and for yellowtail in the waters north of New Zealand for about three months, beginning mid-March. The company planned to employ the converted purse-seine vessel Kenyo Maru (260 gross tons).

The Kenyo Maru is equipped with a power-block and is the first Japanese fishing vessel to use that gear. For the past two years, that vessel conducted test fishing for skipjack off northeast Japan. (Shin Suisan Shimbun, March 9, 1964.)

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NORTH PACIFIC SALMON FISHERY USES MONOFILAMENT GILL NETS:

Monofilament gill nets (originally used in the Japanese North Pacific on an experimental basis a few years ago) are now widely used in the salmon fishery. It is estimated that in 1964 about 60 percent of the gill nets to be

Japan (Contd.):

used in the Japanese mothership-type salmon fishery will be made up of monofilament nets. (Suisan Tsushin, March 6, 1964.)

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POLYPROPYLENE TANGLE NETS TO BE USED IN KING CRAB FISHERY:

After several years of experimentation, one large Japanese fishing company is planning this year on completely changing the king crab tangle nets employed by its mothership (Kaiyo Maru, 5,549 gross tons) operating in the Okhotsk Sea to nets made from polypropylene. Reportedly, the polypropylene net is not only as strong and efficient as the synthetic fiber net presently in use, but is cheaper and easier to handle. The Japanese firm is also reported to be planning on field testing this year about 100 shackles of specially made polyvinyl king crab tangle nets which can be discarded after being used once. (Suisan Tsushin, March 12, 1964.)

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ANTARCTIC WHALING:

The Nisshin Maru No. 3 (23,406 gross tons) whale fleet (belonging to Japan's largest fishing company) is on its way home from the Antarctic whale fishing grounds. As of March 8, 1964, that fleet is reported to have not only met its target of 111 blue-whale units (118 finback whales and 312 sei whales) but has exceeded its original catch target of sperm whales by 561, harvesting a total of 2,665 sperm whales.

The six other Japanese whaling fleets are reported to be doing well also, and were expected to meet their quotas in a few weeks. (Suisan Tsushin, March 11; Suisancho Nippo, March 12, 1964.)

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STERN TRAWLER BUILT IN JAPAN FOR RUMANIA:

The 3,603-ton stern trawler built in Japan for Rumania departed Shimonoseki, Japan, on March 3 for New Zealand waters on an experimental fishing trip. On board that trawler are 17 Japanese fishing and gear experts who will train the Rumanian crew on fishing techniques. The vessel is later expected to operate in the northwest Atlantic Ocean. (Nihon Suisan Shimibun, March 9, 1964.)

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MARKET FOR SHRIMP:

Some Japanese shrimp dealers in mid-March 1964 were reported to be dumping imported frozen shrimp on the Japanese market even at a loss. Reportedly, 21-25 count Mexican frozen shrimp in 5-lb. cartons were being sold for 1,800 yen (US\$5) a carton.

The dumping was attributed to several factors: (1) large supply of shrimp on hand in Japan; (2) need for immediate cash, since March 30 was accounts-settlement date in Japan. Primary blame is placed on the excessive competition taking place after the importation of shrimp was liberalized under the Japanese Government's trade liberalization program. (Minato Shimibun, March 17, 1964.)

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WHALING OPERATION IN ECUADOR:

The establishment of a whaling operation in Ecuador presents many difficult economic problems due to the lack of adequate facilities, including the lack of water and electrical power supply, reports the chief of the whaling department of Japan's largest fishing company, who returned to Japan from Ecuador in mid-March. Another problem cited was the great distance of the whaling grounds from the contemplated base. He stated that he did not engage in any concrete talks with Ecuadorean officials concerning the establishment of Japanese whaling operations in Ecuador. (Suisancho Nippo, March 14, 1964.)

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ANTARCTIC WHALING FLEETS:

Four of Japan's seven whaling fleets operating in the Antarctic Ocean were reported to have met their whale quotas as of mid-March. The remaining three fleets were expected to meet their targets by the end of March. Japan's share for this season's Antarctic quota is 4,600 blue-whale units. (Minato Shimibun, March 17, 1964.)

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WHALING OPERATION IN BRAZIL:

Japan's largest fishing company has decided to terminate its whaling operations based in Brazil. The two whale catcher vessels assigned to the Brazilian base will be tied up at that base. The whaling operations reportedly are being halted due to the depressed Brazilian market for whale meat. (Suisan Tsushin, March 18, 1964.)

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Japan (Contd.):

EFFICIENCY STUDY OF TUNA VESSELS:

The Japan National Federation of Tuna Fishermen's Cooperative Associations is having a scientific organization analyze 1963 tuna vessel catch trends according to vessel sizes. Preliminary examination of the data shows that the operation of 180-ton tuna vessels, which in the past have been considered to be the most efficient among all the different classes of tuna vessels, again showed a profitable rate of return. On the other hand, 99-ton tuna vessels operating out of Japan proper fared poorly. (Suisancho Nippo, March 11, 1964.)

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SHIP-TO-SHIP FUELING OF TUNA VESSELS AT SEA:

The Japan National Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN), at a conference in Tokyo on March 3, 1964, revealed that it is installing on the oil tanker which it plans to utilize for refueling tuna vessels at sea a 150-ton capacity fresh-water tank and two sea-water conversion units capable of producing five tons of fresh water per day. In addition, the tanker would carry provisions, particularly dried vegetables, which would be supplied to those fishing vessels receiving fuel and water.

In 1963 NIKKATSUREN, on an experimental basis, had chartered the 1,500-ton oil tanker Shimmei Maru for refueling tuna vessels on the high seas. The experiment was described as successful but it was strongly criticized by the fishermen's union and the Ministry of Transportation on grounds that the extension of time spent at sea worked hardship on crew members. It was recommended that the tanker should not only carry fuel but also fresh water and food, particularly fresh vegetables.

The proposal was also made that the tanker should have on board a doctor to treat fishermen at sea. This proposal is still under consideration.

The oil tanker to be chartered by the NIKKATSUREN was scheduled to depart Japan in mid-April. (Suisan Keizai Shimbun, March 5, 1964.)

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FIRM FILES APPLICATION TO IMPORT FROZEN YELLOWTAIL FROM MEXICO:

A Japanese trading firm has submitted an application to the Japanese Fisheries Agency to import 1,000 tons of frozen yellowtail (valued at US\$200,000) from Mexico. Yellowtail is normally imported by Japan from the Republic of South Korea, but the Mexican yellowtail can be imported into Japan at a much cheaper price (about 30 percent cheaper based on c.i.f. value). (Suisancho Nippo, February 6, 1964.)

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NEW STERN TRAWLER TO FISH OFF SOUTH AFRICA:

A newly-built stern trawler, Taiyo Maru No. 76 (2,150 gross tons), of one of Japan's largest fishing companies, departed Shimonsaki, Japan, on February 17, for the trawling grounds off South Africa. (Suisan Tsushin, February 18, 1964.)

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FISHING COMPANY PLANS TO CLOSE SOUTH GEORGIA ISLAND WHALING BASE:

The Japanese fishing company which established a whaling base in South Georgia Island (British) in the South Atlantic Ocean in 1963, plans to close down operations at that base. The firm is reported to have not fared well in its operation. As of March 2, the firm's whaling vessels had harvested 189 fin whales and 379 sei whales (equal to 157.66 blue-whale units), and 32 sperm whales. The catch represents 60 percent of the target. Another Japanese fishing company which also had operated whaling vessels out of South Georgia closed its operations in December 1963 because it had also not fared well. (Suisancho Nippo, March 5, 1964.)

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LICENSING MORE VESSELS TO OPERATE IN NORTHWEST ATLANTIC PLANNED:

The Japanese Fisheries Agency is planning on issuing commercial fishing licenses for the operation of not more than ten large fishing vessels (ranging in the 2,000-3,000 ton-class) in the northwest Atlantic Ocean in the fall of 1964. At the present time, the Agency is permitting only experimental fishing in those waters. Vessels presently authorized by the Agency to operate on an experimental basis are the 3,500-ton stern trawler Tenyo Maru (fishing with two 300-ton trawlers) and the

Japan (Contd.):

1,100-ton trawler Aoi Maru No. 2. (Suisan Keizai Shimbun, February 21, 1964.)

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FREEZER CARRIERS TO TRANSPORT ATLANTIC TRAWL FISH TO JAPAN:

Two 1,800-ton freezer carriers owned by Japan's largest fishing company were scheduled to be launched on March 14, 1964, in southern Japan, at Nagasaki and at Shimono-seki. They are the Banshu Maru Nos. 10 and 11. They are being assigned to the Atlantic Ocean run to transport trawl-caught fish to Japan. (Nihon Suisan Shimbun, March 9, 1964.)

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FISHING VESSEL CONSTRUCTION LOAN PROGRAM PROPOSED:

The Japan Fisheries Society scheduled a general meeting at Tokyo on March 17, 1964, to discuss measures to meet foreign fisheries competition. Principal topic on the agenda is the vessel construction financial assistance program.

According to critics, the Government-operated Japan Development Bank is not giving positive assistance in the matter of providing loans for the construction of fishing vessels. Also, interest rates of 9-10 percent are charged by lending institutions on loans for the construction of domestic fishing vessels, while loans at 4 percent interest, with payment extended over seven years, are available for the construction of fishing vessels placed on order by foreign firms with Japanese shipyards.

The Society hopes to have a special fund set aside in the Development Bank specifically for the purpose of providing money at a low interest rate for the construction of fishing vessels so as to enable Japan to meet foreign competition effectively. (Suisan Keizai Shimbun, March 14, 1964.)

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FISHING VESSEL CONSTRUCTION PERMITS ISSUED:

March 13, 1964: The Japanese Fisheries Agency on March 13, 1964, issued permits

for the construction of 30 fishing vessels: 13 wooden vessels totaling 500 tons gross and 17 steel vessels totaling 5,489 tons gross. Included were permits for 4 steel tuna vessels (192, 253, 354, and 362 tons), 3 steel distant-water trawlers (299, 314, and 2,950 tons), and one 39-ton wooden salmon long-liner. (Suisan Keizai Shimbun, March 17, 1964.)

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February 29, 1964: The Japanese Fisheries Agency on February 29, 1964, issued permits for the construction of 29 fishing vessels: 14 wood vessels (totaling 587 gross tons) and 15 steel vessels (totaling 4,987 gross tons). They include 1 wooden salmon vessel of 47 tons for the coastal drift-net fishery and 7 tuna vessels--1 wooden vessel (83 tons), and 6 steel vessels (4 of 192 tons and 2 of 253 tons). Also approved for construction was a 3,000-ton freezer carrier, to be called Ojika Maru, for transporting distant-water trawl-caught fish. (Suisan Keizai Shimbun, March 3, 1964.)

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January 31, 1964: Permits for the construction of 38 fishing vessels were issued on January 31, 1964, by the Japanese Fisheries Agency: 9 wood vessels (289 gross tons total) and 29 steel vessels (totaling 4,440 gross tons). Included are four tuna vessels ranging in size between 64- to 111-gross tons each; one 253-ton tuna long-liner; one 392-ton tuna long-liner; eight 96-ton steel salmon vessels for the salmon mothership fishery; one 69-ton steel gill-net vessel for the coastal salmon fishery; and a 1,510-ton carrier vessel.

On February 18, the Agency issued permits for the construction of 55 fishing vessels; 22 wood vessels (totaling 874 gross tons) and 33 steel vessels (totaling 4,335 gross tons). Included are four 96-ton steel vessels for the salmon mothership fishery; four 39- to 64-ton wooden gill-net and long-line vessels for the coastal salmon fishery; one 498-ton portable-boat-carrying tuna mothership plus one 19-ton portable boat; six 96- to 111-ton steel tuna vessels; and six 253- to 279-ton steel tuna long-line vessels. (Suisan Keizai Shimbun, February 4 & 21, 1964.)

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Japan (Contd.):

FISHERIES CONFERENCE:

A Japanese Korean fisheries conference convened at Tokyo on March 10, 1964. The following items were scheduled for discussion: (1) width of the territorial sea and establishment of base lines; (2) extent of sea areas to be placed under joint jurisdiction and methods of enforcement; (3) jurisdictional rights; (4) composition of the joint regulatory committee and authority to be delegated to that committee; and (5) form of fisheries assistance and amount of financial assistance. (Suisan Tsushin, March 11, 1964.)

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SUCTION PUMP FISHING:

A suction pump has been used to catch fish in Japan, it was reported at the fall meeting of the Japan Fisheries Academy in Otaru. In the course of a survey of modern fishery methods, a team of the Nihon University's Fishery Department was able to land a catch weighing 12.5 kg. (27.5 pounds) in 15 minutes with the aid of a pump. The experiments were conducted from an 11-ton vessel in waters near Ajishima Island off the Ojika peninsula in May and June 1963.

The suction pump was powered by an electric motor connected to a rubber hose 5 meters (16.4 feet) long, with a trumpet-shaped mouthpiece at one end. Lights installed on the ship and fixed to the mouthpiece attracted fish. The technique had been tried before, but on earlier occasions the fish were invariably damaged. It is believed, however, that Soviet fishing boats successfully employ the suction pump-fishing method in the Caspian Sea. (New Scientist, November 21, 1963.)

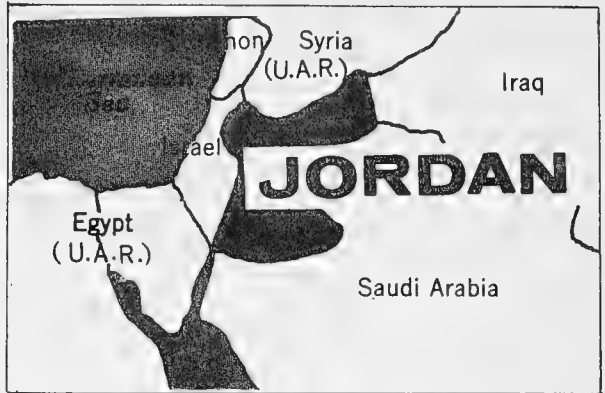


Jordan

FISHERY LANDINGS DROP IN 1963:

Jordan's fishery landings dropped from 185.8 metric tons in 1962 to 159.3 tons in 1963. Fishing agreements were signed which gave Jordan fishing rights in the territorial waters of Saudi Arabia and Sudan, but those rights have not yet been exploited and Jordanian fishermen still use rather primitive fishing methods.

The Jordan Development Board has plans for the purchase of a modern fishing vessel



with 20 to 30 tons of freezing capacity. If funds can be made available for that purpose, it is anticipated that the annual catch will rise to 600 or 700 tons. (United States Embassy, Amman, March 9, 1964.)



Mexico

JAPANESE PROPOSE JOINT VENTURE WITH GUAYMAS SHRIMP-FISHING COOPERATIVES:

According to an official of Mexico's Federacion de Corporaciones Pesqueras Sur de Sonora, which represents fishing cooperatives in Guaymas, a Japanese group visited him in February 1964 and proposed that the cooperatives enter into an agreement with the Japanese firm represented by the group to supply labor for fishing vessels which would be brought from Japan.

The Japanese vessels would be equipped with freezing equipment operated by Japanese technicians, and would pack shrimp, possibly for the European market. Wages would be a percentage of the catch, presumably at least equal to the percentage the cooperatives receive under their contract with Mexican vessel owners (armadores). The Japanese group assured the Mexican official that they were in a position to furnish his cooperatives with a more reliable market than the United States. The group was told by the cooperatives' representative that they would have to take the matter up with appropriate officials in Mexico City. The Japanese group was headed for Puerto Penasco after their Guaymas visit.

It was reported that the Japanese have been interested in a venture of this type for some

Mexico (Contd.):

time and that the Mexican fishing cooperatives had been approached previously by them.

There are 14 fishery cooperatives in Guaymas with 3,500 members, and a total of 238 vessels operate out of that port, according to the cooperatives' official. The annual catch at that port is estimated to be from 7,000 to 8,000 tons.

Virtually all of the shrimp landed at Guaymas is sold to two large United States fishery importer firms in California, and about 90 percent of the Guaymas income is from the shrimp industry. (United States Embassy, Mexico City, February 27, 1964.)

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NEW FISHING PORT PLANNED AT PROGRESO, YUCATAN:

The Department of Marine of the Mexican Government is investing 10 million pesos (US\$800,000) in a new fishing port at Progreso, Yucatan, according to an interview published in El Universal, February 11, 1964.)

Since the present port at Progreso is considered inadequate for expanding fishing operations, the Government will construct a separate port in the marsh area to the west of the city. Principal construction will involve opening a bar in the harbor, dredging to a depth of 10 feet, and building docks. The natural features of the marsh lend themselves to a relatively inexpensive, safe, sheltered harbor.

Construction is expected to be completed in early 1965. Auxiliary facilities will be built later. The new port is expected to facilitate the exploitation of fishery resources in the Gulf of Campeche and the Caribbean Sea. (Regional Fisheries Attache, United States Embassy, Mexico City, February 14, 1964.)

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FIRST MARINE EXHIBIT A SUCCESS:

As part of the Mexican Government's program to improve the national diet by an increased consumption of fishery products, Mexico's National Fisheries Consultative Commission staged a "Salon of the Sea and Its Resources" in conjunction with the Seventh

Home Fair held in Mexico, City, February 14-March 15, 1964.

The marine exhibit covered an area of about 7,200 square yards, attracted very large crowds, and was considered an unqualified success. An estimated 100,000 persons attended the exhibit on the first Sunday and 80,000 the following Sunday. Weekday attendance included numerous school groups. Careful planning and plenty of hard work resulted in an attractive and educational exhibit that will give the traditionally land-oriented Mexican a better understanding and appreciation of his country's marine resources.

Description of Salon: The visitor was first greeted by a huge symbolic mural that set the theme for the entire exhibit, "The Conquest of our Marine Resources." As the visitor progressed through the exhibit, he was given an education in the ocean itself, its inorganic resources and particularly its living resources, the techniques of harvesting and utilization, and finally the end products in the form of canned and dried fishery products, vitamins, etc.

The first section of the exhibit was a well illustrated scientific presentation of the sea in all its aspects, with an explanation which stressed that it was oriented toward the exploitable resources, so as to bring home to the visitor how important the ocean is to him. Exhibits demonstrating the physical composition of sea water, marine geology, fossils, physical oceanography, and the extent of the world's oceans were followed by an exhibit on inorganic resources featuring salt production. Charts outlining the hydrologic cycle, the food chain, and the reproductive cycle introduced the section on marine life which followed a logical progression up the classical system of the plant and animal kingdoms. Step by step, illustrated by charts, photographs, preserved specimens, shells, shark jaws, skeletons, and models, the viewer was led from phytoplankton and kelp to marine mammals, with every intervening stage well represented by species important in the Mexican fisheries. Next was a demonstration of fishing methods, from the primitive to the modern, with descriptive material on fish culture and oyster culture. Charts showed the value of fishery products in nutrition, and a dining room scene had a table set with seafood.

An open court with an aquarium was surrounded by booths of cooperating government

Mexico (Contd.):

agencies. The aquarium consisted of a series of separate tanks displaying a variety of fresh-water fish and salt-water fish species. The aquarium was flanked by a display of ship models and an art gallery which contained paintings, sculpture, ceramics, jewelry, and metal work with a fishery motif or using abalone shell as part of the design.

The visitor then entered a section entitled "Man and the Fishery." In addition to photographs and models, that area contained a philatelic exhibit of stamps dealing with the fisheries and the sea, and a marine library. The industrialization section had models of a fish cannery, a fish-meal plant, and a working ice machine.

In another open court were models of boats and full-size small fishing boats, an actual patrol helicopter, and a full-size steel shrimp boat, along with marine engines, propellers, etc.

A motion picture room showed fishery and marine life films provided by the Governments of the United States, Norway, Japan, the United Kingdom, and Denmark.

The final governmental exhibit was a room containing a relief map of Mexico (including the coasts and fishing banks) which was set into the floor. The walls contained numerous colored charts showing Mexican fishery production and also large woodcuts of fishery scenes. Scientific and popular publications on the fisheries were exhibited.

The remainder of the Salon was a commercial exhibit of marine products, nets, machinery, boats, etc.

Cooperating Mexican Agencies: The National Fisheries Consultative Commission had primary responsibility for the Salon. Its technical consultant, was responsible for the entire exhibit, designing the layout, designing the relief map and fishery charts and even contributing some of the art in the gallery.

The following government agencies had exhibits and otherwise furnished exhibits:

The Department of Fisheries of the Ministry of Industry and Commerce had an exhibit which included models of the marine biological station at El Sauzal, the plant at Tres Ma-

riás where inmates are rehabilitated by working with fish products, a fish market, a school of practical fisheries, and a telephone that answered questions on fisheries.

The National Bank for Development of Cooperatives had an exhibit featuring its pilot fishing port at Alvarado. This exhibit was shared by the Mexican Institute of Renewable Natural Resources. It contained a model of the port and models of the vessels built for the port. One boat model was cutaway and contained a novel aquarium.

The Ministry of Marine featured models of lighthouses, models and maps of harbors, full size navigational aids, etc.

The National Institute of Indigenes demonstrated Indian fishing activities.

The National Institute of Tourist Investigations illustrated the importance of the ocean in attracting both domestic and foreign tourists. The National Council of Tourism illustrated tourist attractions, highlighted by models and maps of the development at Punta Banda near Ensenada.

The Government company (CONASUPO) responsible for distributing staple food to low income groups demonstrated its fish program, principally dried fish. Recipe booklets were available.

The National Development bank had an exhibit showing how its loans have aided the fishing and allied industries. The Department of Game provided specimens of marine birds.

A chart at the entrance of the Salon acknowledged the assistance of several private Mexican firms, and the Embassies of Germany, Denmark, Japan, Norway, United Kingdom, and the United States, as well as the Food and Agriculture Organization (FAO), and United Nations.

Special Features: The two outstanding individual hits of the Salon were the aquarium and the shrimp vessel. Mexico is said to probably be the largest city in the world without some sort of aquarium and the live fish on display, therefore created a sensation. Reportedly live salt-water fish have never been exhibited in Mexico and this "first" created a stir. The logistics involved in transporting, and holding tropical marine fish at that high altitude location were said to have been formidable.

Mexico (Contd.):

The 75-foot steel shrimp vessel on display was cutaway lengthwise leaving some 60 percent intact to show the engine in place, the ice hold, crew quarters, navigational equipment, etc. It was built in Mazatlan by a shipyard known for its construction and export of shrimp vessels overseas. On the temporary ways it appeared huge to the inland people who were unacquainted with fishing vessels and stood around in crowds looking at it in awe.

Among the many features of the Salon were:

1. The more than 40 ship and boat models and the numerous factory, school and port models.

2. The hundreds of fish, mollusks, and crustaceans that were cleverly displayed in oval plastic bubbles suspended from the ceiling. These were preserved in 10 percent formaldehyde and were especially lifelike.

3. The numerous photographs, blown up to very large size--colored and black and white, underwater and above--provided a striking background.

4. Colored charts on the ocean added to the displays.

5. The Mexican Club of Exploration and Aquatic Sports (CEDAM) provided a fine exhibit of submarine archeology with many relics recovered from the bottom of the sea and from lakes.

6. An actual helicopter (made in U.S.) used for patrol by Mexico's Department of Fisheries.

7. Full size fishing vessels, an ancient dugout, a canoa or longboat (fiberglass), sailboats and runabouts (all fiberglass and all made in Mexico except for one from Japan).

8. The colored fishery charts (which were to be reproduced for publication), the relief map of Mexico, approximately 15 x 25 feet, and a large fisheries chart of the Gulf of Mexico.

Commercial Exhibits: The commercial section of the Salon contained exhibits by fishery products canners and producers of vita-

mins and other industrial fishery products, as well as fishing gear and marine supplies. Mexican-made products predominated, but imports were featured among the engines and electronic equipment.

Foreign made equipment on display was varied and included marine engines, generators, centrifuges, electronic navigation equipment, refrigeration machinery, and other marine engine parts from some half dozen countries.

The first "Salon of the Sea and Its Resources" was reported so successful that plans are being made to set up a permanent marine exhibit in Chapultepec Park in Mexico City. (Fishery Attache, United States Embassy, Mexico, March 10, 1964.)

Note: See Commercial Fisheries Review, April 1964 p. 63.



Morocco

TUNA AND SARDINE INDUSTRY DEVELOPMENT PROJECTS:

Tuna: A United States tuna fishery expert revisited Morocco at the invitation of the Moroccan Development Bank to work out a fishing contract with a United States tuna-fishing vessel of about 250 tons. The contract calls for the vessel to carry out a one-year exploratory fishing project to determine the amount, quality, and location of tuna that would be available to an expanded tuna industry in Morocco. The cost of the exploratory project will be about \$200,000. It will be financed by the Moroccan Development Bank and the Government of Morocco.

Sardines: A preliminary survey of the possibility of expanding the United States market for Moroccan sardines has been financed by the Moroccan Export Control Office at a cost of about \$17,000. The survey concentrated on the results which could be obtained by (1) an improved marketing organization and (2) a new high-quality brand of Moroccan sardines on the United States market. (United States Embassy, Rabat, March 2, 1964.)



Netherlands West Indies

**JAPANESE TUNA BASE
AT ST. MARTIN:**

A Japanese cold-storage company, which obtained approval from the Netherlands Government in 1963 to establish a tuna-fishing base on Saint Martin Island, Netherlands West Indies (situated east of Puerto Rico), has constructed a 1,100-ton cold-storage plant on that Island. The plant was scheduled for completion in March 1964.

To manage the fishing and cold-storage operations at that base, the Japanese firm in April 1963 established a wholly-owned subsidiary, capitalized at 102 million yen (US\$283,333). In June 1963, the Japanese firm established another subsidiary company to handle the transshipment of fish from its Saint Martin base. The shipping company reportedly will operate the carrier vessel Zenko Maru No. 1. (Suisancho Nippo, February 10, 1964.)

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**TUNA TRANSSHIPMENT QUOTA
FOR ST. MARTIN BASE:**

The Japanese firm which has been authorized by the Japanese Government to establish a joint tuna enterprise on St. Martin Island (located east of Puerto Rico), Netherlands West Indies, is expected to be granted a 2,000-short-ton transshipment quota for that base. Rather than allot a completely new quota for the St. Martin base, where the Japanese firm has constructed a 1,100 ton capacity cold-storage plant, the Government is planning to reduce that company's American Samoan quota of 8,000 short tons by 2,000 tons and reallocate that amount to the St. Martin base. (Nihon Suisan Shimibun, March 6, 1964.)



New Zealand

**EXPORTS OF SMALL SPINY
LOBSTER BANNED:**

The exportation of small spiny lobster tails under six inches long has been banned by the New Zealand Government. The Government intends that instead of going overseas, those tails should be left on the spiny lobster and that whole spiny lobster should be marketed in 2-lb. consumer packs on the New

Zealand market. Exporters, however, consider that New Zealanders will be reluctant to pay about 5s. (70 U.S. cents) each for small spiny lobsters. This is the price normally received overseas. They claim also that the ban will mean loss of overseas earnings, for New Zealand. (Australian Fisheries Newsletter, February 1964.)



Norway

EXPORTS OF CANNED FISH, 1963:

Norway's total exports of canned fish in 1963 were 4.8 percent less than in 1962. The decline affected all of Norway's principal canned fish products, except smoked small sild sardines. There was a particularly sharp decline in shipments to the United States due

| Norwegian Exports of Canned Fish, 1962-1963 | | |
|---|----------------------------------|--------|
| Product | 1/1963 | 1962 |
| |(Metric Tons) | |
| Brisling | 5,368 | 6,288 |
| Small sild | 14,927 | 14,304 |
| Kippered herring | 3,149 | 4,242 |
| Soft herring roe | 719 | 797 |
| Sild delicatessen | 572 | 651 |
| Other canned fish | 3,309 | 2,950 |
| Shellfish | 1,547 | 1,851 |
| Total | 29,591 | 31,083 |

¹/Preliminary.

in large part to the recovery of the Maine sardine industry which recaptured a good part of the American market for canned sardines. (Norwegian Cannery Export Journal, February 1964.)

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BIG HERRING RUN OFF NORTH COAST:

In early March 1964, a large mass of herring invaded the banks off north Norway from Harstad to Sandnessjøen. The biggest influx was at the mouth of Vestfjorden, off the Lofoten Islands, which traditionally is known for its cod fishery.

By the end of the first week in March 1964, the herring catch in the Vestfjorden totaled over 20,000 metric tons, with an ex-vessel value of more than Kr. 3 million (US\$419,000). According to a fishery scientist, fishermen could land as much as 100,000 tons of herring before the run ended. However, the fishery was not expected to last very long. By the latter part of March, the herring probably spawned and moved into the deep ocean.

Norway (Contd.):

The large herring rush caused extensive damage to nets and in many cases more than half the catch was lost. (News of Norway, March 12, 1964.)

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FISHERIES TRENDS:

March 1964: HERRING: A total of 254,000 metric tons of winter herring had been landed along the Norwegian coast as the week end of March 21, 1964, at which time large herring catches were still being made in waters off the Lofoten Islands.

WHALING: Norway's 4 Antarctic whaling expeditions had processed 196,893 barrels of oil as of March 7, 1964, compared with 180,980 barrels by the same date in 1963, and 247,000 barrels by the comparable date in 1962. (News of Norway, March 26, 1964.)

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January 1964: Bad weather in January 1964 hampered Norwegian fishermen. On the north and west coasts, fishermen were able to fish only about one day a week on the average. Filleting and freezing plants were idle. On the south coast, large herring catches were taken in the Skagerrak during early January. Nine reduction plants in Haugesund and Karmoy reopened to process the catch, but storms soon interfered with fishing and the fish meal factories shut down again.

LOFOTEN COD FISHERY: A majority of the Fisheries Committee of the Norwegian Parliament has recommended that the ban on purse-seines in the Lofoten cod fishery be lifted for the coming season. The minority supported the opinion of the Ministry of Fisheries and the Fisheries Director that the ban should not be lifted.

WHALING: As of January 25, 1964, Norway's four Antarctic whaling expeditions had processed 86,475 barrels of whale oil and 29,480 barrels of sperm oil for a total of 115,955 barrels. This was 11,930 more barrels of oil than in the corresponding period of the 1962/63 season. (News of Norway, February 13, 1964.)

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MODIFIED 12-MILE FISHERIES
LIMIT REJECTED:

In a statement to the 16-nation European Fisheries Conference in London, February 28, 1964, Norway affirmed that it could not subscribe to the new "6-plus-6" fisheries convention which was signed by 13 other countries. Norway objected to the provisions in the treaty which would recognize foreign fishing rights in the 6-12 mile coastal zone. (The Norwegian Parliament had previously authorized local fisheries limits extending a full 12 miles.) As a compromise, Norway offered to extend its present transitional arrangement for foreign fishing rights in the outer 6-mile zone from 1970 to 1974, but the proposal was rejected.

Commenting on the European Fisheries Conference, Arbeiderbladet, a Norwegian Labor Party newspaper, said, "Norway presented strong motivations for its standpoint. It was pointed out that fisheries play a decisive role all along our long and weatherbeaten coast. Therefore, it is of great economic and social importance to us to maintain our present fishery zone. It would be a heavy burden for our fishing population if all other countries permanently were to fish in all waters up to our 6-mile limit. . . . The London conference will now discuss future policies to guide trade in fish products. Here, vital interests are at stake for us. It will be a crucial political and diplomatic task to prevent a commercial isolation which, in the long run, can prove costly for Norway. If we were more or less excluded from European markets, the effect would be felt not least by those parts of Norway in greatest need of expansion and a stronger economy." (News of Norway, March 5, 1964.)

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BAN MAY BE RELAXED ON
FOREIGN LANDINGS:

A new law relaxing the ban on landings of fish in Norway by foreign vessels has been proposed by the Norwegian Minister of Fisheries.

The rules now in force prohibit the landing of fish in Norway by foreign vessels when the catch has been taken by a conventional bottom trawl. Exceptions to that rule are only granted in an emergency, such as an accident at sea which forces a vessel to make for the nearest port.

Under the proposed new law, Norwegian processing plants would be permitted to re-

Norway (Contd.):

ceive fish from foreign vessels during periods of short supply. This has been advocated by some Norwegian operators for several years since their factories are sometimes closed down by seasonal shortages. It is thought that a law permitting foreign landings would result in a more stable supply of fish. (Fishing News, February 14, 1964.)

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FISH REACTION TO GEAR AND ENGINE NOISE STUDIED:

The Oceanographic Research Institute in Bergen, Norway, a branch of the Norwegian Fisheries Directorate, in early 1964 made a series of experiments in the North Sea, near some 350 purse seiners, to record noise made by engines and fishing gear. Researchers obtained sound recordings by lowering hydrophones into the sea at various distances from fishing vessels and fishing gear. The tape-recorded sound will be played back in aquaria where the reaction of various fish species can be observed. As the first step in this phase of the experiment, fish will be accustomed to a certain noise level while they are being fed. The same fish will than be exposed to different noise levels, such as those produced by engines and gear. Thus, investigators hope to measure and record deviations in the fish behavior pattern. The result might provide a better understanding of the extent to which it is necessary to reduce such noise. Efforts will also be made to clarify the reaction of various fish species to marine pressure waves, since fishing gear may create such waves. (News of Norway, March 5, 1964.)



Pakistan

SHRIMP-PRODUCING COSTS:

A leading shrimp exporting firm in Pakistan has estimated its average ex-vessel shrimp costs for the 6-months period ending February 1964 at Rs.1.50 (US\$0.313) a pound for all shrimp purchased. For the larger shrimp normally exported to the United States, the ex-vessel cost per pound was Rs.2.00-3.00 (\$0.417-0.626). Deheading the shrimp reduces the weight by about 40 percent, thus increasing the per-pound-cost of shrimp at the freezing stage to Rs. 3.33-5.00 (\$0.695-

1.043). (United States Embassy, Karachi, February 25, 1964.)



Peru

EXPORTS OF PRINCIPAL MARINE PRODUCTS, JANUARY-SEPTEMBER 1963:

| Item | Quantity | Value ^{1/} | |
|---------------------------------|-------------|---------------------|--------|
| | | Million Soles | US\$ |
| | Metric Tons | | 1,000 |
| Fish meal | 841,475 | 2,274.6 | 84,808 |
| Fish oil | 116,925 | 195.4 | 7,286 |
| Fish (frozen, canned, etc.) . . | 27,349 | 162.3 | 6,051 |
| Sperm oil | 7,079 | 27.1 | 1,010 |
| Fertilizer (guano) . | 3,051 | 7.4 | 276 |
| Whale meal | 2,967 | 6.0 | 224 |

^{1/}F.o.b. values converted at rate of 26.82 soles equal US\$1. Source: United States Embassy, Lima, March 4, 1964.

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FISH-CANNING INDUSTRY RESPONDS TO TAX CONCESSIONS:

Tax measures, enacted in September 1963 to revitalize the fish canning and allied industries in Peru, are apparently having the desired effect. The package of tariff exemptions and tax incentives has reportedly resulted in license applications to reopen 14 fish-canning plants. (United States Embassy, Lima, February 20, 1964.)



Poland

SHIPYARDS BUILDING LARGE TRAWLERS AND FACTORY-TRAWLERS:

A Polish shipyard at Gdansk is building a series of thirteen 1,250-ton factory-trawlers. Nine of the vessels are being built for the Soviet Union and 4 are for a Polish fishery organization based at Gdynia. The factory-trawlers are designed to carry a full range of processing equipment, including a fish meal plant with a daily capacity of about 25 metric tons. Refrigeration equipment will be installed to maintain storage holds at -18° C. (-0.4° F.). The design specifications of the vessels are: length over-all, 278 feet; breadth, 45.2 feet; draft, 17.7 feet; depth to main deck, 23.2 feet; deadweight, 1,250 tons; main engine, 2,400 hp.; operating speed, 12.5 knots; and operating range, 70 days.

Poland (Contd.):

A Polish shipyard located in Gdynia expects to launch at least twelve 600-ton trawlers by the end of 1965. The new trawlers will be capable of carrying 330 tons of fresh fish, 30 tons of fish meal, and 8 or 9 tons of fish-liver oil. The design specifications of the trawlers being built at Gdynia are: length over-all, 229.7 feet; breadth, 36.2 feet; dead-weight, 600 tons; main engine, 1,620 hp.; operating speed, 14 knots; and operating range, 50 days. Each trawler will have accommodations for 41 crewmen. (The Fishing News, February 14, 1964.)

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MARINE FISHERIES LANDINGS IN 1963:

Polish marine fisheries production in 1963 amounted to 207,500 metric tons, surpassing the production goal for the year by 6,000 tons. The production in 1963 represented an increase of 13,000 tons or 26 percent over 1962. (The Fishing News, January 31, 1964.)

**Portugal**TRAWLING OPERATIONS OFF SOUTH AFRICA:

An initial cargo of 700 metric tons of fish caught by Portuguese trawlers operating off the southwest coast of Africa was delivered in Portugal in late February 1964 by the Gil Eanes, according to Portuguese newspaper reports.

Due to the depletion of fishing grounds worked by Portuguese fishermen off the northwest coast of Africa, as well as new fishing restrictions imposed by some countries, Portuguese trawlers have been compelled to move to more distant fishing grounds off the South Africa Republic. It is understood that Portuguese trawlers received authorization to land their catches at unspecified ports of the South Africa Republic where they were frozen and later picked up by the Gil Eanes. If the first shipment is profitable, plans have been made to construct one or more vessels for expanded shipments in the future. (United States Embassy, Lisbon, February 29, 1964.)

**South Africa Republic**PILCHARD-MAASBANKER-MACKEREL FISHERY, 1963:

South Africa Republic west coast landings of maasbanker and mackerel during the short season in November and December 1963 amounted to 13,763 short tons. Added to the previous west coast catch of pilchards, maasbanker, and mackerel during the main fishing season from January to July, this brought the total South Africa Republic west coast shoal fish catch in 1963 to 483,167 tons, compared with 545,569 tons in the previous year.

The November 1963 catch of 9,171 tons of maasbanker yielded 1,497 tons of fish meal, 42,211 gallons of fish body oil, and 2,436,312 pounds of canned maasbanker.

The December 1963 catch consisted of 4,402 tons of maasbanker and 190 tons of mackerel for a total of 4,592 tons, which yielded 828 tons of fish meal, 29,255 gallons of fish body oil, 968,328 pounds of canned maasbanker, and 99,168 pounds of canned mackerel.

The total landings from the 1963 pilchard-maasbanker-mackerel fishery in the South Africa Republic during 1963 yielded 111,068 tons of fish meal, 6,764,911 gallons of fish body oil and 24,509,840 pounds of canned fish. (The South African Shipping News and Fishing Industry Review, February 1964.)

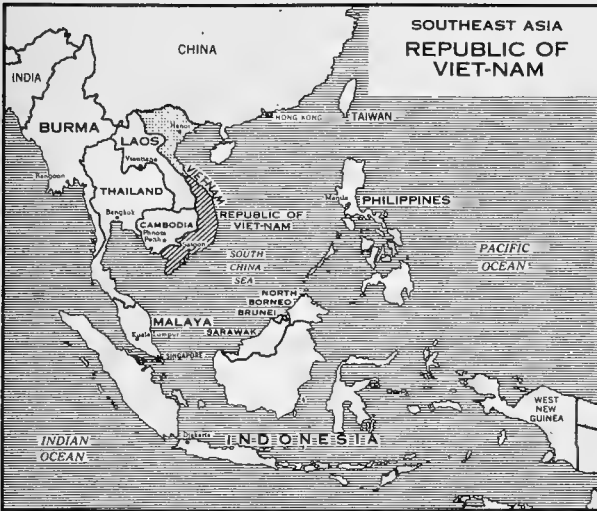
Note: Data shown above only include landings and production in the South Africa Republic. The data do not include landings and production in South-West Africa.

**South Viet-Nam**SHRIMP FISHING POTENTIAL:

The Kien Giang Province in South Viet-Nam was visited in late February 1964, by an economic survey team composed of representatives from the United States Agency for International Development (AID), the Government of South Viet-Nam, and a representative of a United States firm.

Preliminary information developed during the survey indicated that even though shrimp fishing is incidental to the Province's regular fishing activities, the port of Rach-Gia on the Gulf of Siam is still able to supply substantial quantities of shrimp to the local and Saigon

South Viet-Nam (Contd.):



markets. It is evident that the potential availability of shrimp is greater than indicated by past catches.

It is believed that with proper guidance, improved techniques, and concentration on shrimp fishing, a sizable frozen shrimp plant could be maintained in Kien Giang Province. (United States Embassy, Saigon, February 28, 1964.)



Spain

FISH MEAL PRODUCTION AND IMPORTS, 1962/63 AND FORECAST 1963/64:

During the production year November 1962-October 1963, the Spanish fish meal supply for animal feed amounted to 103,249 metric tons, with imports accounting for 70,358 tons of the supply and domestic production accounting for 32,891 tons. (An additional 1,147 tons of fish meal for fertilizer were produced in Spain.) In the same period of 1963/64, forecasts indicate that the Spanish fish meal supply for animal feed will amount to 140,000 tons. The forecasts predict an increase in imports to 110,000 tons, but a decline in domestic production to 30,000 tons. Production and imports represent Spanish consumption of fish meal, since Spain is not presently exporting fish meal.

Spanish mixed feed manufacturers are reported to have agreed to buy 30,000 tons of fish meal a year from domestic producers, after which the remainder of the supply needed can be imported. Fish meal produced in Spain has been more expensive than imported fish meal. In November 1962, the price of domestic fish meal (60 percent protein) on the Spanish wholesale market was 11,750-13,000 pesetas per metric ton (US\$178-196 per short ton), while the price of imported fish meal (60-65 percent protein) was 11,000 pesetas per metric ton (\$166 per short ton). The price of domestic fish meal showed little tendency to decline on the Spanish market until December 1963 when the price of domestic meal (60 percent protein) fell to 9,200-9,500 pesetas per metric ton (\$139-144 per short ton). The price of imported fish meal in Spain during December 1963 was not reported. (United States Embassy, Madrid, March 3, 1964.)

Note: 59.95 pesetas equal US\$1.00.



Taiwan

FISHERIES TRENDS IN 1963 AND OUTLOOK FOR 1964:

The increase in Taiwan's 1963 deep-sea fishery landings was largely due to good catches made by tuna long-line vessels added to the fleet that year. The outlook for the 1964 deep-sea fishery landings is reported promising and expected to exceed those in 1963.

In December 1963, Taiwan's Provincial Government agreed to permit 36 Kaohsiung tuna vessels of 50 tons or less to use Penang as a supply and transshipment base for their fishing operations in the Indian Ocean. In early 1964, the Government agreed to let at least 10 Kaohsiung tuna vessels (all 80 gross tons except one of 120 tons) fish in waters off American Samoa. A representative of one of Taiwan's fishing firms left Taiwan about that time for a survey of that fishing area. It was reported that the entire catch is to be sold to a United States tuna-canning firm in American Samoa.

To the deep-sea fishing fleet will eventually be added the 16 tuna vessels to be built

Taiwan (Contd.):

from the US\$7.8 million loan extended Taiwan by the International Bank for Reconstruction and Development (IBRD), which was signed in September 1963. Earlier this year, the Taiwan Fisheries Bureau was drawing up specifications for construction of those vessels, following which invitations to bid on their construction were to be issued by the Central Trust of Taiwan.

Toward the latter part of 1963, a 550-ton vessel with a crew of 31 sailed for Cameroon. In line with an agreement between Taiwan and Cameroon, the fishing crew aboard that vessel and other vessels will demonstrate their fishing operations to Cameroon fishermen. Another vessel left in early 1964 for the same destination and purpose.

The 12 long-line vessels (160 to 210 gross tons each) added to the fleet in 1963 under a loan from the Joint Commission for Rural Reconstruction (JCRR), operated in the Indian Ocean between February and August 1963. It was reported that 4 of the 12 vessels may be converted to trawlers for fishing in the South China Sea. Another five privately-owned tuna fishing vessels (130 to 200 gross tons) fished in the Indian Ocean during 1963 using Penang and Singapore as a supply base.

Taiwan's fishery exports in 1963 were valued at about \$1.5 million which exceeded the value of the 1962 exports and indicates a growing emphasis on the deep-sea fisheries. The exports included about 225 metric tons of frozen shrimp valued at \$500,000, most of which went to Japan. It was estimated that the exports included about 2,874 tons of tuna valued at \$915,000. One fishing firm which operated six fishing vessels (4 of 350 gross tons and 2 of 600 tons) in the western Indian Ocean accounted for about 2,000 tons of Taiwan's total 1963 tuna exports. (United States Embassy, Taipei, February 19, 1964.)

Note: See Commercial Fisheries Review, March 1963 p. 69.

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FISHERIES AIDED BY WORLD BANK LOAN FOR PURCHASE OF MODERN FISHING VESSELS:

The International Bank for Reconstruction and Development has granted Taiwan a loan of US\$7.8 million for the purchase of 16 modern tuna-fishing vessels. The initial agreement was signed in September 1963. The fish-

ing industry of Taiwan comprises deep-sea and coastal fishing as well as fish farms.

At the end of 1961, Taiwan's fishing fleet consisted of 5,800 motorized vessels totaling 84,000 gross registered tons. The loan will be used for the construction and equipment of 13 vessels of 300 tons each and 3 of 1,000 tons. Each of the 1,000-ton vessels will have on board at least two 20-ton auxiliary vessels.

It is expected that the addition of the new vessels will increase the value of landed fish by \$4½ million a year.

In 1961, Taiwan's fishery landings totaled about 300,000 metric tons, and in 1962 its tuna exports amounted to about \$700,000. (The Fishing News, January 24, 1964.)

Note: See Commercial Fisheries Review, December 1963 p. 78.

**Thailand****FISHERY SUBSIDY FUND USE:**

Officials of the Fish Marketing Organization (FMO) reported on February 18 that the FMO Subsidy Fund established in 1952 to provide assistance to the fishing industry had accumulated a total of 4,623,159 baht (approximately US\$230,000) of which 3,323,689 baht had been expended to aid the industry. Among the projects aided by the fund have been the construction of new piers to facilitate unloading of the fish catch from the fishing boats. The fund is financed through fees imposed on persons selling fish to the FMO, with the fees established as a percentage of the price obtained from the FMO for the fish. (United States Embassy, Bangkok, February 26, 1964.)

**Tunisia****FISHERIES DEVELOPMENT:**

The Office National des Peches (ONP), an agency of the Government of Tunisia, has outlined current and planned fisheries development in Tunisia as follows:

The Tunisian annual fisheries catch increased from 12,803 metric tons in 1957 to 25,000 tons in 1962, and is expected to reach 40,000 tons in the 1970's. The objective of the ONP is to raise fishing activities from the

Tunisia (Contd.):

handicraft to the industrial level and to undertake offshore fishing after 1965.

Several fishing harbors in Tunisia are being built or improved at Tabarka, La Goulette, Kelibia, Mahdia, and Zarzis. The ONP has purchased thirty 20-meter trawlers since 1959 at a total cost of US\$1,800,000. Those vessels represent one-third of the modern Tunisian fishing fleet. Ten more trawlers have been purchased from Yugoslavia for delivery in 1964. Sixty more 20-meter vessels will be purchased between 1965 and 1970. Tenders for the purchase of 2 vessels for offshore fishing will be issued in 1964.

Three shipyards already exist in Tunisia at Bizerte, La Goulette, and Sfax. One hundred small vessels for coastal fishing have been built in those shipyards. After 1965, when the ONP hopes to have 2 new shipyards completed, plans call for the launching of 50 small fishing vessels each month in order to replace obsolete sailing craft. (This could lead to a sizable market for small marine motors in Tunisia.)

In 1963, a total of 500 tons of fish meal was produced in Tunisia at plants in Sidi Daoud and La Goulette. A new fish-meal plant with a daily capacity of 25 tons is being built. A canning plant for sardines, anchovies, and mackerel operates at Sidi Daoud.

The distribution network for fish products in Tunisia includes 40 retail shops. Thirty new shops will open in 1964. A network of refrigeration plants is being built at the harbors and in the interior. It will be served by 50 refrigerated trucks.

Two cold-storage plants costing \$240,000 are being built at Sfax and Gabes to freeze fishery products for export to Europe. To handle foreign distribution, the ONP maintains sales offices in Marseilles, Algiers, and Rome. The ONP plans to open foreign sales offices in Paris and Milan in 1964.

The ONP is also working to develop the shellfish resources of Tunisia. Forty tons of lobsters a year are taken during the summer season near Galite Island. Plans call for that catch to be increased to 60 tons. Cultivation of oysters in Tunisia is expected

to eventually employ 1,000 people. (United States Embassy, Tunis, March 19, 1964.)

Note: See Commercial Fisheries Review, April 1960 p. 65.



U.S.S.R.

FISHING FLEETS IN ATLANTIC OCEAN AND BERING SEA:

According to a Soviet publication dated February 22, almost all of the 548 fishing vessels attached to the Soviet Union's Western Fisheries Headquarter (responsible for the management of vessels based in the Baltic Sea region) prior to that date were fishing in the Atlantic Ocean. Since the beginning of 1964, they had caught over 100,000 metric tons of fish, exceeding by 10,000 tons the catch for the same period in 1963. The Baltic Sea fishing fleet is said to have exceeded its production quota by 130,000 metric tons.

According to another report in a Russian periodical dated February 25, prior to that date there were over 250 Russian fishing vessels operating in the Bering Sea. The vessels were primarily after flatfish and rockfish. (Suisancho Nippo, March 2 and 5, 1964.)

* * * * *

THREE MORE FREEZER-TRAWLERS ORDERED FROM DANISH SHIPYARD:

The Soviet Union has ordered three additional fish freezer-trawlers of 2,550 gross tons each from a Copenhagen shipyard. The vessels will cost about Kr. 70 million (US\$10.2 million) and delivery is to be made by the end of 1965. They will be similar to, but are to be improved versions of, the series of 4 vessels completed by the shipyard in 1962 and 1963, and the series of 4 vessels now being built at the same shipyard.

The vessels are equipped to trawl over the stern or to receive catches from accompanying fishing vessels. The fish are dressed and frozen on board.

More than 30 fishing vessels of this type and similar types have been built for the Soviet Union by the Copenhagen shipyard since World War II. Credit terms rather than price was the more important consideration in obtaining this newest order.

U. S. S. R. (Contd.):

According to a newspaper report, negotiations are under way for the construction of an additional 16 refrigerator vessels. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 4, 1964.)

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**FOUR NEW FREEZER-TRAWLER
DELIVERED TO SOVIET
ATLANTIC FISHING FLEET:**

The Soviet Western Fishery Administration, headquartered at Riga, has received four new freezer trawlers of medium size for its Atlantic fleet. The new vessels are of a type being constructed serially at the Kiev Shipyards. They can fish with trawls or drift nets. Each vessel is equipped with a main engine of 800 horsepower. When under way or during prolonged trawling, automated steering gear on the vessels can be controlled electronically. The freezing capacity of each trawler is 6 metric tons of fish a day. Three of the four vessels (Ampera, Saturnas, and Aloia) have joined the Lithuanian fishing fleet.

In addition to the four new freezer trawlers for the Atlantic fleet, a fifth vessel (Al'tair) of this type will be delivered to the Soviet Far Eastern fishing fleet. (Rybnoe Khoziaistvo, January 1964.)

* * * * *

**EASTERN BERING SEA AND GULF OF
ALASKA FISHING ACTIVITIES,
MARCH 1964:**

The Soviet fishing fleet in the northeastern Bering Sea in late March 1964 was believed to have consisted of at least 125 trawlers, 15 freezerships, 4 factoryships, and 3 cargo vessels. The major emphasis of the fleet was thought to have shifted from herring to Pacific ocean perch and, to a lesser degree, to flounder and sole.

In March 1964, a small Soviet fleet began fishing in the vicinity of Chirikof Island in the Gulf of Alaska. Limited observations indicated they were seeking primarily Pacific ocean perch. Estimates indicated that about 18 trawlers, 1 factoryship, and at least 2 freezerships as well as support vessels were involved in the operation. The size of the fleet was expected to increase rapidly.

In March 1964, another Soviet fleet was fishing in the Gulf of Alaska about 65 miles

west of Yakutat. That fleet consisted of about 35 vessels, including 2 factoryships, a tanker, and about 30 trawlers, which were making excellent catches of Pacific ocean perch. That is the first large-scale Soviet exploitation of the Pacific ocean perch concentrations found off Yakutat by Russian exploratory vessels in 1960 and 1961.

Large-scale Soviet fishing operations in the Gulf of Alaska in 1964 began earlier than in past seasons. The fleet off Yakutat represented the most easterly concerted Soviet fishery on record. (Unpublished sources.)

* * * * *

**SOVIET SCIENTISTS DEVELOP
NEW SPECIES OF SALMON
AND STURGEON:**

Soviet scientists of the Pacific Fisheries and Oceanography Research Institute (TINRO) are reported to have produced a hybrid salmon from the small but prolific mesu salmon of the Indian Ocean and the larger but less fertile Pacific salmon. At first the crossing produced sterile fish. But after 18 months of experimenting, young were produced which were capable of reproducing themselves while maintaining the size and birthrate qualities of the original species. The average size of the new hybrid is from 4-5 kilograms (8.8-11.0 pounds), which is about 3 times as large as the Indian Ocean salmon. The new salmon is said to have an excellent taste.

The Moscow Institute of Marine Biology has announced that one of its scientists has succeeded in hybridizing 2 varieties of sturgeon after 10 years of experimental work. A small but fecund sterlet sturgeon was crossed with a great sturgeon. The latter species range up to 6 meters (20 feet) in size. In August 1963, over 30,000 fingerling of the new hybrid sturgeon were introduced into the Proletarian Reservoir, west of Rostov Na Donu. (Unpublished sources.)



United Kingdom

**FREEZER-TRAWLER LANDS
FROZEN BLOCKS OF WHOLE FISH:**

The first complete freezer-trawler (the Ross Fighter) operating out of Grimsby landed 230 metric tons of 100-pound quick-frozen fish blocks composed of whole (round fish

United Kingdom (Contd.):

caught off the coast of Norway early in February 1964.

The vessel sailed from Grimsby on December 18, 1963, and had sufficiently good fishing during the first week of fishing operations so that it seemed the trip would be completed in about 30 days. The good fishing, however, was followed by a 10-day period of exceptionally cold weather and ice. Fishing was resumed when the weather moderated, and it continued until the vessel's refrigerated fish hold was nearly full to capacity. When the vessel docked, the blocks of frozen fish went directly into a cold-storage warehouse. The blocks will be withdrawn, thawed out, and processed as required.

The Ross Fighter was converted from a conventional steam-driven trawler into a Diesel-engine freezer-trawler and is owned by a British fishing firm which has recently built a number of new type small stern trawlers. (Fish Trades Gazette, February 15, 1964.)

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DANISH-BRITISH TALKS ON FISHERY COOPERATION:

Cooperation in fisheries was among the subjects discussed by the British Foreign Secretary in the course of his official visit to Denmark in early February 1964.

Agricultural and fishery products make up an important part of the trade between the two countries. Only West Germany rivals the United Kingdom as a market for Danish fish-

ery products. In January-November 1963, Danish fishery exports to the United Kingdom were valued at over £4 million (US\$11.2 million). This would indicate that it would be to Denmark's advantage to avoid any rift that might follow the exclusion of British fishing vessels from Danish waters, or those of her dependencies, the Faroe Islands and Greenland.

Following the announcement of majority agreement on a draft convention for modified 12-mile fishery limits at the second session of the European Fisheries Conference in London, it became clear that while Denmark was willing to allow traditional fishing rights to British vessels in Danish waters, similar rights could not be granted around the Faroes and Greenland.

On the other hand, there is growing concern among British fishermen, that while they are being denied access to grounds they have fished for decades, British markets remain open to all.

Denmark's fish-exporting trade could be affected by the recent announcement of accelerated tariff reduction between countries in the European Common Market (EEC), which includes West Germany. This might be detrimental to trade between EEC countries and nonmember countries, in which case the British market would become even more important to Danish fishery exporters.

It is unlikely that the British Foreign Secretary's visit led to any change in the 12-mile fisheries limit for the Faroe, but the British fishing industry feels there is a possibility of a change in negotiation on Greenland's limits. (The Fishing News, February 7, 1964.)

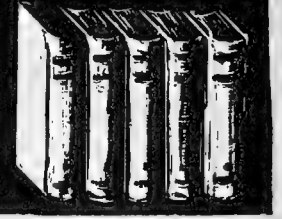


CORRECTION

The article, "Trawler 'Stella Leonis' Wins Silver Cod Trophy for 1963," which appeared in Commercial Fisheries Review, March 1964 page 75, incorrectly reported 1963 landings of fish by the Stella Leonis as 553,784 pounds. The vessel actually landed 39,556 kits (5,537,840 pounds) in 1963.



FEDERAL ACTIONS



Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

ALASKA BOTTOMFISH INDUSTRY POTENTIAL TO BE STUDIED UNDER TECHNICAL ASSISTANCE PROJECT:

Approval of a \$12,000 technical assistance project to study the potential of the Alaskan bottomfish industry was announced by the Area Redevelopment Administration (ARA) of the U.S. Department of Commerce on March 23, 1964. The project will be completed in about five months.

Soviet and Japanese fishing fleets carry on heavy fishing operations off Alaska. The foreign fleets include factoryships equipped with cold-storage and processing equipment.

There is a large United States market for bottomfish (cod, flounder, ocean perch, etc.). At present the United States imports 300 million pounds of bottomfish annually. The ARA survey will help determine if American fishermen can gain a larger share of that market, and the conditions of production and processing required for success. (Area Redevelopment Administration, March 23, 1964.)

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INDUSTRIAL LOAN TO ALASKAN COLD-STORAGE FIRM HANDLING FISHERY PRODUCTS:

The Area Redevelopment Administration (ARA) of the U. S. Department of Commerce on March 18, 1964, announced approval of a \$184,100 industrial loan to the Valdez Cold-Storage Company, Inc., Valdez, Alaska. The ARA funds will help finance a project to expand dock facilities at Valdez, and to purchase, renovate, and equip a factoryship for freezing and processing. The project should aid the salmon and crab industries in the area and help create 91 direct and related new jobs.

The ARA industrial loan, which is repayable in 15 years at an annual interest rate of

4 percent, is conditioned on the provision of a \$56,670 loan by a local bank to help finance the project. In addition, the Valdez Development Company will invest \$28,330, and the company will provide \$14,170 in equity. (Area Redevelopment Administration, March 18, 1964.)

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LAKE SUPERIOR COMMERCIAL FISHING INDUSTRY TO BE AIDED BY TECHNICAL ASSISTANCE PROJECT:

The approval of a technical assistance project to provide advisory and research services to help improve the commercial fisheries industry in the Lake Superior area was announced by the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce on March 5, 1964. ARA will provide \$83,500 in technical assistance funds and the U. S. Department of the Interior will contribute \$19,000 to finance the project, which will be directed by the Interior Department's Bureau of Commercial Fisheries in cooperation with scientists of Michigan State University.

During the past 20 years, the 16-county region adjacent to Lake Superior has relied on the fishing industry as a basic source of income. Since 1954 there has been a severe decline in commercial fishing in the area due to the near extinction of the lake trout population because of sea lamprey depredation. Trout fishing in Lake Superior has been closed since June 1962 in an effort to maintain breeding stock.

As part of the new assistance project, two-man technical teams will consult with the processors and fishermen in an effort to expand income and employment through increased efficiency of operations and marketing. The project will also seek to expand consumer use of the abundant supplies of lake herring, smelt, chub, and other small fish which have been considered less marketable because of size. In order to spread

the fishing season over longer periods, the project will experiment with trawl fishing, a technique which has proved effective in Lake Michigan and Lake Erie. (Area Redevelopment Administration, March 5, 1964.)



Department of the Treasury

COAST GUARD

HEARINGS ON LIGHTS AND FOG SIGNALS ON OFFSHORE PLATFORMS IN THE GULF OF MEXICO:

The Merchant Marine Council of the U. S. Coast Guard held hearings March 23, 1964, on proposed changes in Coast Guard regulations. One of the proposed changes would reduce the number of lights on offshore platforms in the Gulf of Mexico and in general relax the regulations with respect to the lights and fog signals required on some of the offshore platforms.

Officials of the National Fisheries Institute opposed the proposed amendments to the regulations (Subchapter C--Aids to Navigation). An attorney representing shrimp fishing interests also opposed the proposed amendments. At the conclusion of the testimony, the Chairman of the Council announced that the Coast Guard had received a request that action on the proposed amendment regarding lights and fog signals on offshore platforms be deferred for a period of 90 days, and stated that the request had been granted.



Eighty-Eighth Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



ALASKA DISASTER RELIEF: S. 2719 (Jackson and others) introduced in Senate April 8, 1964, to amend the Alaska Statehood Act (act of July 7, 1958; 72 Stat.

339) and for other purposes; referred to Committee on Interior and Insular Affairs. Discussing the bill, Senator Jackson spoke from the floor of the Senate stating in part, "I sent to the desk for appropriate reference, a bill authorizing an Office of Alaska Reconstruction which will provide, through earthquake insurance, reasonable protection to the people of that State against loss of or damage to their real and personal property. In order to provide assistance to Alaskan property owners and businessmen for damage caused by the recent earthquake and related disasters, benefits under this proposed Federal insurance and reinsurance program would be retroactive to the date of Alaska statehood, January 3, 1959. The program's terms of insurance would be determined by the Office of Alaska Reconstruction. . . ." Senators Bartlett, Gruening, and Magnuson, who joined with others in sponsoring the bill, also spoke from the floor of the Senate on the Alaskan disaster and the State's need for assistance. (Congressional Record, pages 7010-7019.) A companion bill, H. R. 10818 (Rivers), was introduced in House April 13, 1964; referred to the Committee on Interior and Insular Affairs. The Senate Committee on Interior and Insular Affairs, sitting as a Special Committee of the Whole on Alaska, held hearings April 14 and 15, 1964, on S. 2719. Testimony was received from Congressman Rivers, the Mayor of Kodiak, the Mayor of Anchorage, and public witnesses. The hearings were recessed subject to call. On April 15, 1964, the Speaker of the House presented a memorial of the Legislature of the State of Alaska, memorializing the President and the Congress of the United States relating to a national Natural Disaster Insurance Act.

On April 16, 1964, Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries held a hearing regarding the effects of earthquakes and tidal waves on Alaskan fisheries. Testimony was received from Senator Gruening, Congressman Rivers, the Governor of Alaska, and officials of the U. S. Department of the Interior. The testimony included an outline of a proposed four-point Federal program to meet the immediate needs of the Alaskan fishing industry.

H. R. 10686 (Pelly) introduced in House April 6, 1964, to provide financial assistance to Alaskan fishermen adversely affected by the earthquake of March 27, 1964, and resulting tidal waves; referred to the Committee on Merchant Marine and Fisheries.

On April 7, 1964, the President signed into law (P.L. 88-296) H. J. Res. 976, making a supplemental appropriation of \$50 million to replenish the disaster relief fund of the President. On March 18, 1964, the Federal Disaster Act Report (H. Doc. 249) from the President was printed in the Congressional Record, page 5348. Included was a report of the status of disaster relief funds as of December 31, 1963. These funds are to be used for aid in Alaska earthquake-damaged areas.

Senator Gruening, along with various other Senators, spoke from the floor of the Senate on March 30, 1964, concerning the recent earthquake and tidal waves in Alaska and along the West Coast. He announced that a program would be prepared concerning the disaster for presentation to the President and the Congress. (Congressional Record, pages 6272-6276.)

Senator Bartlett also spoke from the floor of the Senate on the above subject on March 30, 1964, stating that the Alaskan fishing industry had been very hard hit. (Congressional Record, pages 6349-6353.) On March

31, 1964, Senator Gruening spoke from the floor of the Senate, inserting in the Congressional Record, (pages 6396-6411) news articles describing the damage in Alaska from the recent earthquake and tidal waves. One of the articles (New York Times, March 31, 1964) concerned the possibility of a price increase in fishery products, particularly canned crab. On April 2, 1964, Senator Gruening spoke from the floor of the Senate inserting in the Congressional Record pages 6547-6559, additional news articles describing the damage in Alaska from the recent earthquake and tidal waves. One of the articles discussed the possible effect on salmon resources of the loss of water in the Copper River. Another article mentioned a proposal to make fishing vessels available to Alaska fishermen to harvest salmon during the coming fishing season. Senator Gruening also discussed the Alaskan disaster from the floor of the Senate April 13, 1964 (Congressional Record, pages 7571-7572), and April 17, 1964 (Congressional Record, pages 7986-7987).

ANTIDUMPING ACT AMENDMENT: H. R. 10832 (Herlong), and similar bills through H. R. 10868, introduced in House April 14, 1964, to amend the Antidumping Act, 1921; referred to the Committee on Ways and Means. The objective of the U. S. Antidumping Act is to prevent foreign manufacturers from injuring American industries by dumping surplus merchandise here at prices below those charged in the exporting country. If the Treasury Department finds a price differential, and the Tariff Commission finds an American industry is injured, the foreign manufacturer must pay the differential to the Treasury in dumping duties. Bills were introduced in the 1st Session of the 88th Congress to make the Act more effective in achieving its original purpose and to help insure that international trade would be conducted in a fair and equitable manner.

In introducing H. R. 10832, Congressman Herlong spoke from the floor of the House stating, in part, "I should like to make clear that the 1964 amendment to the Antidumping Act represents a merging of the proposals embodied in the amendments introduced during the first session of this (88th) Congress with a few proposals which add to, modify, or delete various provisions. . . ." The Congressman's remarks, appearing in the Congressional Record, pages 7601-7602, continued with a detailed description of the proposed changes contained in the 1964 amendment to the Antidumping Act.

COAST GUARD APPROPRIATIONS: On March 24, 1964, Congressman Garmatz addressed the House on the subject of the Coast Guard equipment replacement and improvement program. He discussed the effects of a \$10 million reduction in the funds authorized under P.L. 88-281 for procurement of vessels and aircraft and construction of shore and offshore establishments for the Coast Guard. The Congressman inserted in the Congressional Record (page 5964) a list of projects to be deferred to make a reduction of \$10 million in Coast Guard appropriations for fiscal year 1965. The list of projects that would be deferred included the construction of one medium endurance vessel for fisheries patrol off the New England coast.

CONSERVATION OF MARINE FISHERIES RESOURCES: The House Committee on Merchant Marine and Fisheries met in executive session on March 25, 1964, and ordered reported favorably to the House S. 1988 (amended), to prohibit fishing in the territorial waters of the United States and in certain other areas except by

domestic vessels or as provided by international agreement.

Fishing In U.S. Territorial Waters (Hearings before the Committee on Merchant Marine and Fisheries, House of Representatives, 88th Congress, 2nd Session), 208 pp., printed. Contains hearings held Feb. 19, 20, 25, and 26, 1964, on S. 1988, and related bills. Includes the text of S. 1988, H. R. 7954, H. R. 8296, H. R. 9957, H. R. 10028, and H. R. 10040; reports from various Federal agencies; and statements of Congressmen, Federal and state officials, and industry personnel.

H. R. 10492 (Downing) introduced in House March 18, 1964, to extend the national sovereignty of the United States over certain waters; referred to the Committee on Foreign Affairs. Would extend "complete and exclusive national sovereignty over the waters within a line 12 geographical miles distant from the line of ordinary low water along that portion of the coast of the United States which is in direct contact with the open sea and the line marking the seaward limit of inland waters."

On March 21, 1964, Senator Bartlett spoke from the floor of the Senate on fisheries limits and inserted in the Congressional Record (page 5660) a paper entitled, "The Theory and Practice of the 12-Mile Fishery Limit," which had been presented to the Gulf and Caribbean Fisheries Institute at their meeting in Miami, Fla., during November 1963.

FEDERAL WATER RESOURCES RESEARCH PROGRAM: On March 23, 1964, the House received a communication from the President of the United States, transmitting a report by the Federal Council for Science and Technology entitled Federal Water Resources Research Program for Fiscal Year 1965; referred to the Committee on Interior and Insular Affairs.

FOOD MARKETING NATIONAL COMMISSION: A message was received in the Senate, April 1, 1964, from the President making legislative recommendations for establishment of a National Commission on Food Marketing to study the food industry from farm to consumer. In his message the President said, in part, ". . . Information is not now available to permit an informed judgment concerning the effect of the recent changes in the food industry. We do not know whether the benefits of advanced technology are being fairly distributed among farmers, processors, distributors, retailers, and consumers. We do not know whether shifts in bargaining power require new laws. We do not know enough about the new character of the industry to determine the extent of the benefits and the need for any relief from hardship which may be necessary." Referred to Committee on Commerce. The message was printed in the Congressional Record, page 6484, April 1, 1964. By unanimous consent, the Senate adopted an amendment on April 1, 1964, to substitute language of the proposed legislation recommended by the President for establishment of a National Commission on Food Marketing for the text of S. J. Res. 71, introduced April 26, 1963, directing the Federal Trade Commission to make an investigation of chainstore practices which may be in violation of antitrust laws. S. J. Res. 71 was pending in the Senate Committee on Commerce. Companion resolutions introduced were H. J. Res. 977 (Cooley), H. J. Res. 978 (Roosevelt), H. J. Res. 979 (Kastenmeier), H. J. Res. 980 (Rosenthal), and H. J. Res. 983 (Olson) introduced in House April 6, 1964, and H. J. Res. 996 (Cunningham) introduced in House April 14, 1964; all referred to the Committee on Agriculture. The resolutions introduced

April 6 were discussed on the floor of the House by Congressman Roosevelt (Congressional Record page 6683) and Congressman Kastenmeier (Congressional Record, page 6718, April 6, 1964.)

On April 13, 1964, the Senate Committee on Commerce continued hearings on S. J. Res. 71, to establish a National Commission on Food Marketing to study food marketing from the farm to the consumer. The Committee heard testimony from an Assistant Secretary of Labor on April 13, and from the Secretary of Agriculture on April 16, 1964.

FOREIGN FISHING VESSELS OFF U. S. COASTS: On April 16, 1964, Senator Jackson spoke from the floor of the Senate concerning foreign fishing vessels off U. S. coasts, and the proposed extension of Canadian fishing limits to 12 miles. (Congressional Record, page 7938.)

HALIBUT WEEK: H. Con. Res. 285 (Pelly) introduced in House April 6, 1964, and H. Con. Res. 287 (Stinson) introduced in House April 14, 1964, requesting the President to proclaim the 6-day period beginning May 18, 1964, and ending May 23, 1964, as National Halibut Week; both referred to the Committee on the Judiciary.

A companion resolution, S. Con. Res. 79 (Magnuson and Jackson), was submitted April 15, 1964 in the Senate; referred to the Committee on the Judiciary. The remarks of Senator Magnuson in submitting the resolution appear in the Congressional Record, pages 7858-7859.

HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS, FY 1965: H. Rept. No. 1316, Department of Labor, and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1965 (April 10, 1964, report from the Committee on Appropriations, House of Representatives, 88th Congress, 2nd Session, to accompany H. R. 10809), 58 pp., printed. Included are funds for the Food and Drug Administration; also funds for the Public Health Service's environmental engineering and sanitation program, and water supply and water pollution control program. The environmental engineering and sanitation program is designed to assure that only safe water, milk, shellfish and other marine food, and food supplies are served to the public; and to provide for research on shellfish and other marine foods. The water pollution program provides for regional laboratories located in strategic points throughout the country to promote research and training activities and provide a base of action of State, interstate, and Federal agencies cooperating to eliminate water pollution.

INDIAN FISHING RIGHTS: S. J. Res. 170 and S. J. Res. 171 (Magnuson) introduced in Senate April 17, 1964, regarding Indian fishing rights; referred to Committee on Interior and Insular Affairs. The text of the resolutions together with remarks by Senator Magnuson were published in the Congressional Record, pages 8065-8067. Senator Magnuson stated that S. J. Res. 170 was introduced "to establish that State statutes, rules, and regulations relating to hunting and fishing shall be presumed to be necessary for conservation in certain areas. This would authorize State regulation of the time and manner of fishing outside an Indian reservation when such regulations are for the purpose of conservation and are equally applicable to all persons." Speaking in regard to S. J. Res. 171, Senator Magnuson said, in part, "I also introduce for appropriate reference a joint resolution on the same subject. . . . This second approach provides for the acquisition by the

Secretary of the Interior of the Indian treaty rights to fish at all usual and accustomed places in common with other citizens. . . ."

INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT: After adopting an amendment thereto, the Senate on April 8, 1964, concurred in House amendment to S. 1605, a bill to amend the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, to provide for labeling of economic poisons with registration numbers, to eliminate registration under protest, and for other purposes. The amendments (concerning registration and review procedures for decisions on registration) and a statement by Senator Ribicoff on S. 1605 and the amendments were published in the Congressional Record, pages 6967-6969, April 8, 1964.

On March 26, 1964, Senator Ribicoff spoke from the floor of the Senate on the subject of pesticide buildup in water sources. In his remarks, he mentioned announcements by the U. S. Public Health Service and the State of Louisiana concerning water pollution involving pesticides which appears to be the cause of fish kills in the lower Mississippi drainage basin and its estuarine waters in the Gulf of Mexico. The Senator also mentioned the placing of three widely used pesticides under "severe restrictions" by the British Ministry of Agriculture, Fisheries, and Food. In his remarks, Senator Ribicoff inserted a statement by the U. S. Public Health Service, a letter from the Louisiana State Board of Health, and several newspaper articles discussing the effects of pesticides. (Congressional Record, page 6250, March 26, 1964.)

On April 2, 1964, Senator Ribicoff spoke from the floor of the Senate on the fish kills in Louisiana which have been attributed to pesticides. The Senator announced that public hearings on the buildup of pesticides in water resources and the general environment would be held by the Subcommittee on Reorganization and International Organizations of the Senate Committee on Government Operations. The hearings began April 7, 1964, when testimony was received from officials of the Department of Health, Education, and Welfare. On April 8, 1964, officials of the Interior Department, and the Food and Drug Administration testified. Subsequent sessions were devoted to testimony from Department of Agriculture officials, Federal Aviation Agency officials, state officials, and others.

INTERIOR APPROPRIATIONS, FY 1965: The Subcommittee of the Senate Committee on Appropriations met in executive session on April 1, 1964, and approved for full committee consideration with amendments H. R. 10433, making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1965, and for other purposes. On April 4, 1964, the Senate Committee on Appropriations reported favorably, with amendments, H. R. 10433. On April 8, 1964, Senator Hayden filed 4 notices in writing of his intention to move to suspend the rules for the purpose of proposing amendments to H. R. 10433.

Interior Department and Related Agencies Appropriations for 1965 (Hearings before a Subcommittee of the Committee on Appropriations, United States Senate, 88th Congress, 2nd Session; on H. R. 10433), 1,611 pp., printed. Included are testimony, statements, and exhibits relating to funds for the Fish and Wildlife Service; the Office of the Commissioner, and its two bureaus, Commercial Fisheries and Sport Fisheries and Wildlife.

S. Rept. No. 971, Interior Department and Related Agencies Appropriation Bill, 1965 (April 4, 1964, report from the Committee on Appropriations, U. S. Senate, 88th Congress, 2nd Session, to accompany H. R. 10433), 43 pp., printed. Included are funds for the Fish and Wildlife Service: its two bureaus--Commercial Fisheries and Sport Fisheries and Wildlife--and the Office of the Commissioner.

For the Bureau of Commercial Fisheries, under management and investigations of resources, the Committee recommended an appropriation of \$18,669,900, an increase of \$837,000 over the House allowance, but a decrease of \$1,961,100 from the budget estimate. (For management, the Committee recommended \$490,734, an increase of \$100,000 over the House allowance and the budget estimate. For research, the Committee recommended \$11,908,200, an increase of \$737,000 over the House allowance, and an increase of \$138,900 over the budget estimate. For marketing and technology, the Committee recommended \$4,457,500, the same as the House allowance, but a decrease of \$75,000 from the budget estimate. The Committee concurred in the House allowances and budget estimates for the following: research on fish migration over dams--\$1,396,700; fishing vessel mortgage insurance--\$41,800; Columbia River fishery facilities--\$2,249,900; and increased Pay Act costs--\$250,066.) The Committee concurred in the action of the House proposing to transfer \$2,125,000 from the Pribilof Islands fund to the "management and investigations of resources" activity. That transfer had not been provided for in the budget estimate.

The additions recommended by the Committee under "management and investigations of resources" are: \$132,000 for acquisition of a vessel and additional reservoir research in South Dakota; \$100,000 for more adequate management and enforcement of fishing regulations in international waters; \$50,000 for initiation of a research program on shellfish processing and utilization at Ketchikan, Alaska; \$325,000 for initiation of a research program on North Atlantic lobsters; and \$230,000 for initiation of a program to survey and research the sea clam.

Also for the Bureau of Commercial Fisheries, the Committee concurred with the House allowance and budget estimate of \$300,000 for the special foreign currency program. In addition, the Committee concurred with the House allowance and budget estimate of \$4,788,000 for construction. (That will provide \$1 million for the Shellfisheries Research Center at Milford, Conn.; \$1.5 million for a biological research laboratory for the tropical Atlantic area; \$1,350,000 for the first phase construction of an exploratory fishing vessel; \$350,000 to equip a fishery research vessel for use in the North Pacific and Bering Sea; and \$588,000 for conducting the Columbia River fishery facilities program.)

For the general administrative expenses of the Bureau of Commercial Fisheries, the Committee recommended \$667,000, the same as the House allowance, but a decrease of \$9,000 from the budget estimate of \$676,000.

For the Bureau of Sport Fisheries and Wildlife, the Committee recommended an appropriation of \$50,989,300, an increase of \$1,980,600 over the House allowance, and an increase of \$3,353,300 over the budget estimate. The increases include additional funds for the construction of sport fish facilities, including fish hatcheries and fishery research facilities.

The Committee concurred with the House appropriation for the Office of the Commissioner of \$425,000, an increase of \$32,000 over the budget estimate.

INTERNATIONAL CONVENTION FOR THE NORTH-WEST ATLANTIC FISHERIES: On April 1, 1964, the Senate received a copy of the protocol (Ex. B, 88th Cong., 2nd Sess.) to the International Convention for the Northwest Atlantic Fisheries signed at Washington, D. C., February 8, 1949, which protocol relating to harp and hood seals was signed at Washington, D. C., July 15, 1963, by the United States and 11 other governments; referred to the Committee on Foreign Relations.

OCEANOGRAPHY: H. R. 10904 (Wilson) introduced in House April 15, 1964, to establish the National Oceanographic Agency; referred to the Committee on Merchant Marine and Fisheries. The bill would establish a National Oceanographic Agency as an independent agency to establish a coordinated national program for oceanography and related sciences, including meteorology. All functions relating to oceanography now being carried out by separate agencies would be transferred to the National Oceanographic Agency. The remarks of Congressman Wilson in introducing the bill and the text of the bill appear in the Congressional Record, pages 7781-7782.

On March 23, 1964, the House received a communication from the President of the United States, relative to forwarding advance copies of two publications of the Federal Council for Science and Technology that set forth Government-wide plans and budget details entitled National Oceanographic Program, Fiscal Year 1965, Parts I and II; referred to the Committee on Merchant Marine and Fisheries.

Property rights, oceanography, and international law were discussed by Congressman Hanna under an extension of remarks on April 8, 1964 (Congressional Record, Appendix page A1728). Under an extension of remarks, Congressman Hanna commented on plans of the U. S. Navy to create an Institute of Naval Oceanology. A newspaper article discussing the Institute was inserted by the Congressman in the Congressional Record, Appendix page A1764, April 9, 1964.

A paper titled "Industry and the Economy of the Sea," delivered to the Governor's Conference on California and the World Ocean was inserted by Congressman King in the Congressional Record, pages 7612-7621, April 14, 1964.

SCHOOL-LUNCH PROGRAM USE OF IMPORTED PRODUCTS: S. 2694 (Miller) introduced in Senate March 25, 1964, to prevent schools participating in the school-lunch program under the National School Lunch Act from serving lunches containing any meat, poultry, or fish, or any product thereof, imported into the United States; referred to the Committee on Agriculture and Forestry. Senator Miller's statement of the need for the bill appeared in the Congressional Record, page 5977, March 25, 1964.

TRANSPORTATION AMENDMENTS OF 1964: On April 9, 1964, the House Committee on Rules deferred action on H. R. 9903, a bill to amend the Interstate Commerce Act and the Federal Aviation Act of 1958 so as to strengthen and improve the national transportation system, and to implement more fully the national transportation policy, and for other purposes.

VESSEL CONSTRUCTION SUBSIDY AMENDMENT: H. R. 10682 (McIntire) introduced in House April 6, 1964, to amend the act of June 12, 1960, for the correction of inequities in the construction of fish vessels, and for other purposes; referred to the Committee on Merchant Marine and Fisheries.

WATER RESOURCES COUNCIL: The Subcommittee on Irrigation and Reclamation of the House Committee

on Interior and Insular Affairs held hearings March 24, 1964, on H. R. 3620 and S. 1111, similar bills, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a water resources council and river basin commissions, and by providing financial assistance to the States in order to increase State participation in such planning.



MARINE SCIENTISTS DRILL INTO OCEAN FLOOR

Scientists from the Institute of Marine Science, University of Miami, have succeeded in drilling 186 feet into the ocean floor at a depth of 2,000 feet at a Caribbean site southwest of Jamaica. Working from the 174-foot vessel Submarex, owned and operated by a California firm, and aided by the Institute of Marine Science Research vessel Gerda, the investigators anchored in deep water and obtained deep-sea sediments dating back some 20 million years. The operation constitutes the first phase of Project LOCO (Long Cores). Planned and directed by the Institute of Marine Science, with the cooperation of the California firm and the financial support of the National Science Foundation, the Miami investigators hope eventually to obtain continuous core samples of up to one-half mile in length from the ocean floor.

Sediment in deep-sea cores is dated by radioactive methods and by identifying tiny fossil shells embedded in it. About half the ocean floor is covered with a mud containing the empty shells of Foraminifera, tiny protozoans that live near the ocean surface. As the organisms die and sink, they contribute to the bottom sediment, known as Globigerina ooze, which accumulates at a rate of about one inch in a thousand years. When major changes occur at the earth's surface--such as when a large mountain range is created, an oceanic current shifts its course, or a major glaciation causes a lowering of temperatures--the character of the sediment and the types of shells buried in it change. Thus deep-sea sediments contain a unique record of the past history of the earth.

It is, of course, not easy to sample these sediments. One method, developed by Prof. Börje Kullenberg in Sweden during World War II and extensively used today involves the lowering to the sea floor of up to 60 feet of steel pipe by means of a steel wire. Iron weights, placed on top of the pipes, force them into the sediment and piston placed inside helps the sediment to enter from the bottom opening. The longest core ever raised by this method is 66 feet long. In order to reach and sample deeper sediments, drilling equipment must be used.

The California marine exploration firm of Los Angeles acquired considerable experience in drilling through the deep ocean floor when it conducted, more than two years ago, the first phase of the MOHO Project off the coast of southern California. The purpose of that project is essentially to sample the upper mantle, which underlies the crust of the earth at a depth of 3 to 4 miles below the ocean floor. The purpose of the Institute of Marine Science's LOCO Project, on the other hand, is to sample in continuity the sediments of the deep-sea floor, which are 1,000 to 3,000 feet thick, and to thus gain an insight into the past history of the earth.



FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
 FL - FISHERY LEAFLETS.
 SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
 SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
 SSR, FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

| Number | Title |
|----------|--|
| CFS-3405 | - California Landings, October 1963, 4 pp. |
| CFS-3407 | - Mississippi Landings, October 1963, 3 pp. |
| CFS-3408 | - Mississippi River Fisheries, 1962 Annual Summary, 9 pp. |
| CFS-3409 | - Mississippi Landings, November 1963, 3 pp. |
| CFS-3414 | - North Carolina Landings, December 1963, 4 pp. |
| CFS-3415 | - New Jersey Landings, November 1963, 4 pp. |
| CFS-3416 | - New Jersey Landings, December 1963, 3 pp. |
| CFS-3420 | - Michigan Landings, November 1963, 3 pp. |
| CFS-3423 | - Ohio Landings, November 1963, 3 pp. |
| CFS-3424 | - Ohio Landings, December 1963, 3 pp. |
| CFS-3425 | - Alabama Landings, December 1963, 4 pp. |
| CFS-3426 | - Fish Meal and Oil, December 1963, 2 pp. |
| CFS-3428 | - Maryland Landings, December 1963, 4 pp. |
| CFS-3429 | - Ohio Landings, 1963 Annual Summary, 4 pp. |
| CFS-3430 | - Louisiana Landings, December 1963, 3 pp. |
| CFS-3431 | - Georgia Landings, January 1964, 2 pp. |
| CFS-3432 | - North Carolina Landings, January 1964, 4 pp. |
| CFS-3433 | - Virginia Landings, December 1963, 4 pp. |
| CFS-3434 | - South Carolina Landings, January 1964, 2 pp. |
| CFS-3435 | - New York Landings, December 1963, 4 pp. |
| CFS-3437 | - Florida Landings, January 1964, 7 pp. |
| CFS-3439 | - Shrimp Landings, September 1963, 8 pp. |
| CFS-3450 | - Advance Report on the Fisheries of the United States, 1963, 23 pp. |

Wholesale Dealers in Fishery Products (Revised):

| | |
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| SL-24 | - Minnesota (Great Lakes Area), 1963, 1 p. |
| SL-26 | - Illinois (Great Lakes Area), 1963, 2 pp. |
| SL-27 | - Indiana (Great Lakes Area), 1962, 1 p. |
| SL-33 | - North Dakota (Mississippi River and Tributaries), 1962, 1 p. |
| SL-37 | - Kansas (Mississippi River and Tributaries), 1962, 1 p. |

Sep. No. 702 - Lake Erie Fisheries Explorations, May-November 1960.

FL-481 - The Use of Aquatic Plants in the Home Aquarium, 4 pp., revised, May 1963.

FL-552 - Estimated Federal Income Tax Procedure for Commercial Fishermen: Questions and Answers, by DeVora R. Alexander, 6 pp., October 1963.

FL-562 - Sacramento River Chinook Disease (SRCD), by Thomas J. Parisot, 2 pp., October 1963.

SSR-Fish. No. 422 - Records and Observations from Plankton Grid Studies off Baja California, April 1952, by David Kramer, 44 pp., illus., September 1963.

SSR-Fish. No. 444 - Northeast Pacific Albacore Oceanography Survey, 1961, by R. W. Owen, Jr., 40 pp., illus., November 1963.

SSR-Fish. No. 445 - Factors Influencing the Return of Fall Chinook Salmon (*Oncorhynchus tshawytscha*) to Spring Creek Hatchery, by Charles O. Junge, Jr. and Lloyd A. Phinney, 36 pp., illus., June 1963.

SSR-Fish. No. 448 - Crab Larvae (*Callinectes*), in Plankton Collections from Cruises of M/V Theodore N. Gill, South Atlantic Coast of the United States, 1953-54, by Paul R. Nichols and Peggy M. Keney, 17 pp., illus., October 1963.

SSR-Fish. No. 450 - Molt in the Northern Fur Seal, by Victor B. Schaeffer and Ancel M. Johnson, 38 pp., illus., October 1963.

SSR-Fish. No. 451 - A Method for Tagging Immature Herring, by John E. Watson, 7 pp., 1963.

SSR-Fish. No. 455 - Counts of Red-Tide Organisms, *Gymnodinium breve*, and Associated Oceanographic Data from Florida West Coast, 1960-61, by Alexander Dragovich and others, 43 pp., illus., October 1963.

SSR-Fish. No. 473 - Economic Survey of the U. S. Fisheries in the Passamaquoddy Region, 1956-57, by Giulio Pontecorvo and Leslie W. Scattergood, 18 pp., illus., December 1963. The proposed Passamaquoddy Project would be built in an area important for its fisheries. An economic survey of the primary and secondary fisheries of the area has been made. In the primary fishery, the herring was most important; clams and scallops were quite valuable; groundfish, anadromous and catadromous fish, and lobsters were of minor importance. Average value of herring landings in 1948-57 was \$102,000; clams, \$60,000; scallops, \$15,000; and the remaining species all less than \$5,000. In the Project area 24 weirs, 7 stop seiners, and 16 carriers operated. Detailed information on investments, operating costs, and profits

is presented. The secondary survey covered the herring-processing industry whose 20 plants manufactured \$11 million worth of products.

Annual Report for 1962, Branch of Fishery Management Services, by Edward C. Kinney, 39 pp., illus., 1963.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF.

Fishing Vessel Management from "Review of the (Japanese) Tuna Fishery," by Shoichi Masuda, Translation Series No. 7, 28 pp., processed, February 1964. (Translated from the Japanese, Review of the (Japanese) Tuna Fishery, Chap. VI, Sec. B, Item 3, pp. 390-410.)

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, November and December 1963, 8 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the months indicated.

California Fishery Market News Monthly Summary, Part II, Fishing Information, February 1964, 21 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego, Calif. 92100.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated. Includes information on the U. S. Navy picket vessel albacore catch for 1963. In continuation of the cooperative trolling program which was started in 1960, the U.S. Navy logged albacore catches at each of its radar early warning surveillance stations off the west coast of the United States. The catch for 1963 was the highest for any one year since inception of the program. A total of 1,041 albacore was taken by the picket fleet. The estimated weight of this catch is about 10,858 pounds, or 5.4-tons. For the fourth consecutive year, distribution and availability of albacore off the U. S. west coast has exhibited a striking correlation with prevailing sea surface temperatures.

Frozen Mexican (West Coast) Shrimp Prices, 1959-1963, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 208, Post Office Bldg., San Pedro, Calif. 90731.)

List of Primary Receivers of Imported Fishery Products and Byproducts at New Orleans, La., 1964, 4 pp., March 1964. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.)

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, February 1964, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore;

the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, January and February 1964, 24 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--January 1964, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

Seattle--Landings, Receipts, and Value of Fishery Products, 1963, by Charles M. Reardon, 37 pp., March 1964. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Reviews Pacific Northwest fisheries trends and their effect upon Seattle fishery receipts for 1963. Contains statistical tables on landings by U. S. halibut fleet; Seattle's landings and receipts of fishery products; carload and truckload shipments of fishery products by months; imports of canned fishery products; receipts of Alaska canned fish and shellfish; and names, classifications, and approximate standards as used on Seattle Wholesale Market. Also presents data on receipts of fresh and frozen fish and shellfish; fresh and frozen salmon receipts and imports; ex-vessel landings and prices of fish by the otter-trawl fleet; Puget Sound canned salmon pack; and related information.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, February 1964, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

The Natural Resources of Ohio, 59 pp., illus., printed, 45 cents, 1963. Includes sections discussing the fish and wildlife resources of Ohio and the program of the U. S. Fish and Wildlife Service in that State.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALASKA:

Progress Report for the Years 1960-1961-1962, Report No. 12, 82 pp., illus., printed. Alaska Department of Fish and Game, Juneau, Alaska. Reports on accomplishments of the Alaska Department of Fish and Game since statehood was acquired on January 1, 1960. The report discusses the harvest and its values, research, development, regulatory management, support functions and activities, and organization. Appendixes contain data on harvests and values for commercial fisheries, development projects, and publications and films.

ALGAE:

A Culture Method for Marine Diatoms and Flagellates, by B. Wisely and C. Purday, 7 pp., illus., printed. (Reprinted from Tuatara, vol. 11, no. 1, March 1963, pp. 20-26.) Commonwealth Scientific and Industrial Research Organization, Marine Laboratory, Cronulla, N. S. W., Australia.

Some New Records and Range Extensions of Florida Marine Algae, by Harold J. Humm, Contribution no. 504, 11 pp., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 13, no. 4, December 1963, pp. 516-526.) Institute of Marine Science, 1 Rickenbacker Causeway, Miami 49, Fla.

ANCHOVIES:

"Anchovy Fishing Off the Chilean Coast," article, The South African Shipping News and Fishing Industry Review, vol. XIX, no. 1, January 1964, pp. 79, 81, 83, 85, illus., printed, single copy 30¢ (about 45 U. S. cents). Thomson Newspapers, South Africa (Pty.) Ltd., 8th Floor, Trust House, Thibault Sq., Box 80, Cape Town, South Africa Republic. Describes the operations of the Iquique fleet of 60 purse-seiners ranging in size from 45 to 85 feet, of both wood and steel construction; separators in the fish oil plant; factory power transmission; stickwater pumps; and pumps on the jetty.

BARRACUDA:

"New Light on an Ocean Killer," article, New Scientist, vol. 21, no. 375, January 23, 1964, p. 200, illus., printed, single copy 1s. 3d. (about 20 U.S. cents). Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

BEAKED FISH:

The Beaked Fishes of Maryland, by Frank Schwartz, Educational Series No. 54, 4 pp., illus., printed.

Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

BERING SEA:

Peculiarities of Ichthyofauna Distribution in Southeast Bering Sea, USSR, by V. P. Shuntov, OTS 63-31519, 20 pp., illus., printed, August 13, 1963, 50 cents. Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

BIOCHEMISTRY:

"Studies on the External Mucous Substance of Fishes. 8--Quantitative Analysis of the Mucus-Polysaccharide from Some Fishes," by N. Enomoto and others, article, Nihon Suisan Gakkai-shi, vol. 29, no. 6, June 1963, pp. 542-545, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, Shibakaidori 6, Minato-ku, Tokyo, Japan.

BIOLOGICAL RESEARCH:

Chesapeake Biological Laboratory, Its Facilities, History and Program, Educational Series No. 62, 34 pp., illus., printed, January 1964. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md. Describes in detail the physical facilities of the Chesapeake Biological Laboratory, Solomons, Md.; the history of the Laboratory since its founding in 1924 by Dr. R. V. Truitt; its present staff and program; accomplishments in both practical and academic studies; and goals for the future.

BRAZIL:

Establishing a Business in Brazil, by Gertrude Heare and William Frohlich, OBR 63-149, 24 pp., printed 15 cents, December 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) Foreign investments in Brazil have been fostered since 1955 by the existence of provisions encouraging the importation of capital equipment, licensed without exchange cover, as a direct foreign investment. This report discusses Government policy on investment, entry and repatriation of capital, tariff concessions to industry, and business organization. Also covers patents, copyrights, and trade marks; regulations affecting employment; taxation; and United States tax aspects of Brazilian investments.

Foreign Trade Regulations of Brazil, OBR 63-150, 12 pp., printed, 15 cents, December 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) Import substitution, protection of newly-established factories, and restriction on the purchase of foreign exchange are the methods used by Brazil to achieve its foreign trade policy aims. The report discusses Brazil's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, Brazil's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

BYPRODUCTS:

Fish from the Port of Gloucester to Your Feed Mill, by Raymond N. Allen, 4 pp., illus., printed. (Reprinted from Eastern Feed Merchant, March 1960.) New

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

England By-Products Corp., 28 Church St., Winchester, Mass. The processing of industrial fishery products and byproducts plays an important role in formulating fees for poultry, turkeys, and swine. This article discusses the processing of inedible portions of ocean perch into fish meal, oil, and solubles. Also covers briefly the history of the Gloucester fishing industry and its present operation.

"Ovenstone-INDUS Factory in Chile is Now in Full Operation," article, The South African Shipping News and Fishing Industry Review, vol. XIX, no. 1, January 1964, pp. 67, 69, 73, 77, illus., printed, single copy 30¢ (about 45 U. S. cents). Thomson Newspapers, South Africa (Pty.) Ltd., 8th Floor, Trust House, Thibault Sq., Box 80, Cape Town, South Africa Republic. Discusses the fish meal and fish body oil plant at Iquique, Chile, jointly financed and operated by Ovenstone South West Investments Ltd. and Chile's Compania Industrial. Describes the history of the joint venture and the operations of the plant. Much of the equipment and even the building itself were constructed in South-West Africa. Plans are already being made to double its present capacity of 50 metric tons of fish an hour.

CALIFORNIA:

California Fish and Game, vol. 50, no. 1, January 1964, 66 pp., illus., printed, single copy 75 cents. Printing Division, Documents Section, Sacramento, Calif., 95814. Includes, among others, these articles: "The Sand Shark, Carcharias ferox (Risso), in California," by Anita E. Daugherty; "An Experimental Study to Control Oyster Drills in Tomales Bay, California," by C. Irwin Haydock; "Underwater Tagging Gun," by Earl E. Ebert; "Notes on the Life History and a Description of the Sharpnose Seaperch, Phanerodon atripes (Jordan and Gilbert)," by J. Gary Smith; "Landings Estimates of California's Marine Recreational Salmon Fishery," by Paul T. Jensen; and "Observations on Spawning Pacific Sardines," by Robert S. Wolf.

The California Marine Fish Catch for 1962, Fish Bulletin 125, 44 pp., illus., printed, 1964. Office of State Printing, Documents Section, P. O. Box 1612, Sacramento, California, 95807. A summary of the 1962 landings of the California commercial fishing fleet, the imports from other states or foreign countries of fresh fish received for processing, and the catches of the partyboat fleet. Statistical data cover landings and shipments of leading species, by weight and value; annual landings and shipments, 1916 through 1962; number of licensed commercial fishermen; number of registered fishing vessels by length; and origin of shipments, 1962. Also included are data on origin of commercial fish landings, 1962; monthly landings and shipments, 1962, by areas and statewide; value and poundage, annual landings and shipments by areas, 1962; value of landings and shipments by ports and areas, 1962; partyboat sport catch, 1953-62; and live bait catch, 1962.

State of California Fish and Game Code, 1963, compiled by Monica O'Brien, 292 pp., illus., printed. Department of Fish and Game, 722 Capitol Mall, Sacramento, Calif. 95814. Covers provisions of this code relating to the taking, processing or use of birds, mammals, fish, mollusks, crustaceans, amphibians, or reptiles.

Also covers some provisions which relate or apply to or affect the taking, processing or use of fish, mollusks, crustaceans, kelp and other aquatic plants for commercial purposes. Discusses the organization and functions of the Fish and Game Commission and the Department of Fish and Game. Includes, among others, a section on commercial fishing which covers provisions pertaining to particular species of fish and shellfish--sardines, anchovies, salmon, lobster, crab, abalones, clams and other mollusks, salt-water and anadromous fish, fresh-water fish, and fresh-water fish used for bait.

CANADA:

Annual Report 1963, 20 pp., printed, 1963. Fishermen's Co-Operative Association, Prince Rupert, B. C., Canada.

British Columbia Catch Statistics, 1963 (By Area and Type of Gear), 203 pp., illus., processed, February 5, 1964. Department of Fisheries of Canada, 1155 Robson St., Vancouver 5, B. C., Canada. The thirteenth annual report of fish-catch statistics for British Columbia based on Departmental copies of sales slips that are completed by all commercial fish buyers operating within the Province. The report is divided into three sections: (1) summary of landings by district and total landed value of all fish; (2) highlights of catch statistics--a general review of significant events in the salmon fishery and a review for other species; and (3) detailed district and area monthly statistics by type of gear. Certain economic, weather, and conservation factors that have a bearing on the catch are also reviewed.

Federal-Provincial Conference on Fisheries Development, January 20-24, 1964, Background Papers, 107 pp., printed, 1963. Department of Fisheries, Ottawa, Canada.

Journal of the Fisheries Research Board of Canada, vol. 20, no. 6, November 1963, 224 pp., illus., printed, single copy C\$2. Queen's Printer, Ottawa, Canada. Includes, among others, articles on: "Body Fluid Regulation in Smolting Atlantic Salmon," by Arthur H. Houston and Lawrence T. Threadgold; "On the Problem of Maximum Yield from North Pacific Sockeye Salmon Stocks," by Robert R. Parker; "Studies on the Life History and Ecology of the Bigmouth Buffalo, Ictiobus cyprinellus (Valenciennes)," by R. P. Johnson; "Use of Coloured Tags in Fish Population Estimates," by G. H. Lawler and G. F. M. Smith; "2-Phenoxyethanol as a General Anaesthetic for Sockeye Salmon," by H. S. Sehdev, J. R. McBride, and U. H. M. Fagerlund; "Effects of Formalin on Length and Weight of Fishes," by Robert R. Parker; "Olfactory Perception in Migrating Salmon. III--Stimulants for Adult Sockeye Salmon (Oncorhynchus nerka) in Home Stream Waters," by U. H. M. Fagerlund and others; "Fecundity of Grand Bank Haddock," by V. M. Hodder; and "Minke Whales, Balaenoptera acutorostrata Lapepede, of the Western North Atlantic," by D. E. Sergeant.

Journal of the Fisheries Research Board of Canada, vol. 21, no. 1, January 1964, 215 pp., illus., printed, single copy C\$2. Queen's Printer, Ottawa, Canada. Includes, among others, articles on: "Laboratory Observations on Embryonic Development and Larvae of the Pacific Cod (Gadus macrocephalus Tilesius)," by

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

C. R. Forrester; "Lethal Concentrations of Copper and Zinc for Young Atlantic Salmon," by J. B. Sprague; "Movements of Young Atlantic Salmon in a Small Stream," by Richard L. Saunders and John H. Gee; "Ultraviolet Irradiation of Circulating Refrigerated Fish Storage Brines," by J. W. Boyd and B. A. Southcott; "Variations in the Growth of Atlantic Cod (*Gadus morhua* L.)," by A. C. Kohler; "Polyphosphate Treatment of Frozen Cod. I--Protein Extractability Lipid Hydrolysis," by W. J. Dyer and others; "Water-Thawing of Frozen Cod Blocks," by W. A. MacCallum and D. G. Ellis; "Activity Cycles in the Brown Trout (*Salmo trutta* L.). 2--Fish Artificially Fed," by D. R. Swift; and "Observations on Herring Spawning Off Southwest Nova Scotia," by R. A. McKenzie.

Report and Recommendations of the Newfoundland Fisheries Commission to the Government of Newfoundland, April, 1963, 123 pp., printed, 1963. Newfoundland Fisheries Commission, St. John's, Newfoundland, Canada.

33rd Annual Report, 1962, Department of Fisheries, 137 pp., illus., printed, 1963. Queen's Printer and Controller of Stationery, Ottawa, Canada. Presents the functions and activities of the Department of Fisheries for the year 1962, and the financial statements of the Department for the fiscal year 1962/63. Covers in detail the activities of the Department's Conservation and Development Service, Protection Branch's patrol vessels, Inspection Service, Economics Service, Information and Consumer Service, and Industrial Development Service. Also covers the Fishermen's Indemnity Plan, and activities of the Fisheries Prices Support Board, Fisheries Research Board of Canada, international commissions, and special committees. Canada's Pacific and Atlantic Coast and lake fisheries are also discussed. Statistics cover the quantity and value of fish and shellfish landed, exports by type of product, number of fishermen in Canada, and value of vessels and gear. The appendix contains financial statements for fiscal year 1962/63, and statements on fish-culture development.

CANNING:

"Canned Sprats and Herrings as Well as Salmon Substitutes in Oil Flavored with Smoke Extracts, by B. Schobler, article, *Fischerei-Forschung*, vol. 5, no. 4, 1962, pp. 13-15, printed in German. Institut für Hochseefischerei und Fischverarbeitung, Rostock-Marienehe, Germany.

CARP:

Why Destroy the European Carp?, by A. Dunbavin Butcher, Fisheries Circular No. 6, 10 pp., illus., processed, 1962. Fisheries and Wildlife Department, 605 Flinders St., Melbourne C2, Australia.

CHESAPEAKE BAY:

Data from Virginia-Maryland Cooperative Fish Trawl Surveys in Chesapeake Bay, 1957 and 1958, by William H. Massmann and Romeo J. Mansueti, Special Scientific Report No. 42, 21 pp., printed, 1963. Institute of Marine Science, Gloucester Point, Va.

Effects of Civilization on Striped Bass and Other Estuarine Biota in Chesapeake Bay and Tributaries, by Romeo J. Mansueti, Contribution No. 191, 17 pp., illus.,

printed. (Reprinted from Proceedings of the Gulf and Caribbean Fisheries Institute, Fourteenth Annual Session, November 1961, pp. 110-136.) Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

CLAMS:

Effect of an Introduced Clam (CORBICULA) on Water Quality in the Tennessee River Valley, by Ralph M. Sinclair, 14 pp., illus., processed, 1963. Tennessee Stream Pollution Control Board, Tennessee Department of Public Health, 620 Cordell Hull Bldg., Nashville, Tenn.

COD:

Longlining Experiments for Cod off the East Coast of Newfoundland and Southern Labrador, 1950-1955, by Wilfred Templeman and A. M. Fleming, Fisheries Research Board Bulletin 141, printed, \$1.50. Queen's Printer, Ottawa, Canada.

"Quality Changes in Stored Refrozen Cod Fillets," by W. J. Dyer and others, article, *Bulletin, Institut International du Froid*, vol. 1, Annexe 1962, pp. 1-9, illus., printed in French. Institut International du Froid, 177 Boulevard Maiesherbes, Paris XVII, France.

Sedimentation and Aggregation of Cod Myosin: A Re-appraisal, by J. J. Connell, Torry Memoir No. 148, 11 pp., printed, 1963. (Reprinted from *Biochimica et Biophysica Acta*.) Torry Research Station, Aberdeen, Scotland.

COMMISSIONS:

(Atlantic States Marine Fisheries Commission) Minutes of the 22nd Annual Meeting (September 24-26, 1963, Boston, Mass.), 181 pp., illus., processed, limited distribution. Atlantic States Marine Fisheries Commission, 336 E. College Ave., Tallahassee, Fla., 32301. Covers the minutes of the 22nd annual meeting of the Commission with details of attendance; the first, second, third, and fourth general sessions; and section meetings of the North Atlantic, Middle Atlantic, Chesapeake Bay, and South Atlantic Sections. Also includes accounts of the individual section meetings, resolutions recommended for adoption, and the executive committee and biological committee meetings. Appendices include, among others, reports on the technological committee meeting, Commercial Fisheries Research and Development Act of 1963, developments in Washington on fisheries legislation, seasonal abundance of juvenile pink shrimp in the nursery grounds, and preserving the fisheries of estuarine waters. Also included in the appendices are reports on legislation and resource conservation, pesticide research, the Co-operative Program for the Certification of Interstate Shellfish Shippers--1963, evaluation of commercial and sport fisheries of the Atlantic Coast, and Soviet fishing activity along the East Coast of the United States during 1963.

COPEPODS:

A Study of the Temperature Factor in Twelve Species of Oceanic Copepods, by Hilary B. Moore and Maria Foyo, Contribution no. 503, 14 pp., illus., printed. (Reprinted from *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 13, no. 4, December 1963,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

pp. 502-515.) Institute of Marine Science, 1 Rickenbacker Causeway, Miami 49, Fla.

COSTA RICA:

Foreign Trade Regulations of Costa Rica, by Rodney D. Anderson, OBR 63-155, 8 pp., printed, 15 cents, December 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C., 20402.) Basic goals of the Central American Common Market, of which Costa Rica is in the process of becoming a member, are: (1) the diversification of production for both the domestic and foreign markets, which also will serve to stabilize Central American exchange earnings as well as the domestic economy; and (2) the development of a broader internal market, thereby enabling domestic industries to take advantage of economies of scale. The report presents information on Costa Rica's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, export controls, United States foreign trade controls, and diplomatic representation between the two countries.

CRAYFISH:

Crayfishes of the Cheat River Watershed in West Virginia and Pennsylvania. Part II--Observations upon Ecological Factors Relating to Distribution, by Frank J. Schwartz and William G. Meredith, Contribution No. 207, 14 pp., illus., printed. (Reprinted from *The Ohio Journal of Science*, vol. 62, no. 5, September 1962, pp. 260-273.) Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

Ecological Population Expansion of the Introduced Crayfish, *ORCONECTES VIRILIS*, by Frank J. Schwartz, Robert Rubelmann, and James Allison, Contribution No. 233, 8 pp., illus., printed. (Reprinted from *The Ohio Journal of Science*, vol. 63, no. 6, November 1963, pp. 266-273.) Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

DEPARTMENT OF THE INTERIOR:

Annual Report 1963, The Secretary of the Interior (For the Fiscal Year Ending June 30, 1963), 490 pp., illus., printed, \$1.75, 1964. U. S. Department of the Interior, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) The activities of the Department's bureaus and offices, including the U.S. Fish and Wildlife Service (and its two Bureaus--Commercial Fisheries and Sport Fisheries and Wildlife), are summarized in this report.

DOLPHIN:

Studies on Fishing Conditions of the Dolphin, *Coryphæna hippurus* L., in the Western Region of the Japan Sea. 8--Comparison of Juvenile Fish Fauna in the Sea and in the Stomachs of Dolphin, by S. Kojima, article, *Nihon Suisan Gakkai-shi*, vol. 29, no. 6, June 1963, pp. 507-513, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

DRIED FISH:

"Relationship between Relative Humidity and Moisture Absorbed in Dried Fish Products", by M. Takei, article, *Nihon Suisan Gakkai-shi*, vol. 29, no. 6, June 1963, pp. 525-530, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

EAST AFRICA:

Annual Report 1962, 20 pp., printed, 1963. East African Marine Fisheries Research Organization, Zanzibar, Zanzibar.

ECOLOGY:

Effects of Winter Water Conditions on Two Species of Marine Fishes, by Frank J. Schwartz, Contribution No. 241, 2 pp., printed. (Reprinted from *Ecology*, vol. 44, no. 3, Summer 1963, pp. 622-623.) Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

Results and Prospects of Acclimatization of Fish and Invertebrates to Water Bodies of USSR, OTS 63-41075, 21 pp., printed, 50 cents, November 6, 1963. Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

Some Problems on the Reproductive Ecology of Marine Bottom Invertebrates with Pelagic Development, by S. A. Mileikovskii, Translations No. 100, 27 pp., printed, 1963. Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, Suffolk, England.

ELECTRIC TRAWLING:

"Elektrotraly" (Electric Trawls), by V. A. Shentiakov, article, *Rybnoe Khoziaistvo*, vol. 38, no. 4, 1962, pp. 47-55, illus., printed. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

EL SALVADOR:

Basic Data on the Economy of El Salvador, by Thomas K. Brewer, OBR 63-145, 24 pp., printed, 15 cents, December 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) A report on the economy of El Salvador, smallest of the Latin American Republics. The Government established a Council for Economic Planning and Coordination in May 1962. The aims of the Council are to plan and coordinate the economic activities of the nation toward maximum orderly and continuous growth and to achieve a better standard of living for all the people by broadening opportunities of progress and welfare. The report discusses some general information on geography, climate, government, and population; structure of the economy; agriculture; forestry and mining; industry; power; transportation; communications; finance; foreign trade; economic development; and diplomatic representation between the United States and El Salvador. A section on fishing discusses the shrimp fishery, the fishery for tuna and other species, and the fishing law of 1955. Also included are a number of statistical tables including one giving data on U.S. imports of Salvadoran shrimp, 1957-1962.

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EUROPEAN FREE TRADE ASSOCIATION:

Third Annual Report of the European Free Trade Association for the Period 1st July, 1962-30th June, 1963, 46 pp., illus., printed, July 1963. Secretariat, European Free Trade Association, Geneva, Switzerland. (Available from the Washington Information Office, European Free Trade Association, 711 14th St. N.W., Washington, D. C., 20005.) Discusses principal accomplishments of the EFTA during the year, internal activities of the Association, organization of EFTA, relations with other organizations, economic developments in EFTA in 1962/63, Association agreement with Finland, and amendments and implementation of the EFTA Convention. By the end of 1962 the intra-EFTA tariffs on industrial goods had been reduced by 50 percent. In May 1963, decisions were taken which will mean that by the end of 1966 all obstacles to the free movement within EFTA of goods covered by the Convention will have been abolished. Included in the report is a section on the Association's actions to facilitate an expansion of trade in fish and other marine products which will provide reasonable reciprocity to Member States whose economies depend to a great extent on exports of those products.

FISH DETECTION:

"Measurement of the Dimensions of Fish to Facilitate Calculations of Echo Strength in Acoustic Fish Detection," by R. W. G. Haslett, article, Journal du Conseil, vol. 27, 1962, pp. 261-269, illus., printed. Conseil Permanent International Pour l'Exploration de la Mer, Charlottenlund-Slot, Denmark.

FISHERIES RESEARCH:

"Discovery: Britain's Sea-Going Research Laboratory," article, New Scientist, vol. 17, no. 323, 1963, pp. 117-179, illus., printed. Harrison, Raison and Co., Ltd., Cromwell House, Fulwood Place, High Holborn, London WC1, England.

International Collaboration in Fisheries Research, by C. E. Lucas, Marine Reprint No. 214, 18 pp., printed, 1963. Department of Agriculture and Fisheries for Scotland, Marine Laboratory, Aberdeen, Scotland.

FISHERY DEVELOPMENT:

"Problems of Fishery Development in Primitive Communities," by R. S. Rack, article, Proceedings of the Nutrition Society, vol. 21, no. 1, 1962, pp. 114-120, printed. Cambridge University Press, 200 Euston Road, London NW1, England.

FISH MEAL:

"Fish Waste for Feeding Pigs. II--Comparison of Digestibility and Utilization of Nutrients of Fishmeal and Fish Silage," by C. Lewicki and M. Wojciak, article, Roczniki Nauk Rolniczych, vol. 79, 1962, pp. 221-227, printed in Polish with Russian and English summaries. Instytut Rybactwa Srodladowego, Palace Kultury Nauki, 27 Pietro, Pokoj 2719, Poland.

"Hydrolysed Fodder Yeast and Fishmeal in Rations for Pregnant Sows," by I. I. Ismailov, article, Svinovodstvo, no. 2, 1962, pp. 36-37, printed in Russian. Akedmiia, Svinovodstvo, Selskokhoviainslvennyi, Nauk-Bibliotek, Moscow, U.S.S.R.

"The New Protein Utilization of Fish Meals Manufactured in Chile for Human and Animal Consumption,"

by G. Donoso and E. Yanez, article, News Summary, International Association of Fish Meal Manufacturers, no. 10, 1962, pp. 66-76, printed in English with French, German, and Spanish summaries. (Translated from the Spanish, Nutricion, Bromatologia, Toxicologia, Chile, vol. 1, no. 2, 1962, pp. 97-105.) International Association of Fish Meal Manufacturers, 70 Wigmore St., London W1, England.

"Nutritional Evaluation of Fish Meals Using Four Short-Term Chick Tests," by L. E. Ousterhout and D. G. Snyder, article, Poultry Science, vol. 41, 1962, pp. 1753-1757, printed. Poultry Science Association, Ohio State University, Columbus 10, Ohio.

"Protein Quality of Different Types of Herring-Meal in Balance Experiments With Growing Pigs," by T. Homb, article, Meldinger fra Norges Landbrukshogskole, vol. 41, no. 5, 1962, p. 31, printed in Norwegian with English Summary. Meldinger fra SSF, Bergen, Norway.

FISH OILS:

"Epoxidation of Some Marine Animal Oils and Properties of the Epoxides as Plasticizers," by S. Komori and others, article, Journal, Chemical Society of Japan, vol. 64, 1961, pp. 1203-1208, printed. Suru, Gadai-Kauda Chiyoda-Ku 5, 1-Chome, Tokyo, Japan.

FISH POPULATIONS:

Role of Youth in Creating Abundance of Fish, USSR, by A. Isayev, OTS 63-31507, 6 pp., printed, 50 cents, August 12, 1963. Office of Technical Services, U.S. Department of Commerce, Washington, D. C., 20235.

FISH PROTEIN CONCENTRATE:

"Effect of Supplementing Sorghum and Groundnut Diets with Fish Flour or Pure Amino Acids," by J. Adrian, R. Jacquot and M. Forestier, article, Annales de la Nutrition et de l'Alimentation, vol. 15, 1961, pp. 227-237, printed in French. Centre National de la Recherche Scientifique, 13 quai Anatole-France, Paris VII, France.

A Report to the Fishing Industry on an Improved Method of Producing Fish Protein Concentrate, by H. E. Power, New Series Circular No. 10, 2 pp., processed, September 21, 1962. Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

FISH SAUSAGE:

"Produksjonen av Fiskepølser in Japan" (Production of Fish Sausages in Japan), article, Tidsskrift for Hermetikindustri, vol. 49, no. 12, December 1963, pp. 489-492, illus., printed in Norwegian. Norske Hermetikfabrikers Landsforening, Stavanger, Norway.

FISH SILAGE:

"Fish Silage as a Protein Feed for Fattening Pigs," by L. V. Braunschweig and H. Gorlitz, article, Deutsche Landwirtschaft, vol. 12, 1961, pp. 461-462, printed in German. Deutscher Bauernverlag, Reinhard-str. 14, Berlin NW7, Germany.

"Fish Silage--A Valuable Animal Protein Feed," by G. Schellner, H. Trautmann, and G. Linke, article, Jahresbericht Arbeitsgemeinschaft Fütterungsberatung, vol. 3, 1960/61, pp. 202-209, printed in German. Fütterungsberatungsstelle, Dresden A 1, Germany.

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FOOD AND AGRICULTURE ORGANIZATION:

World Food Congress, Technical Commission, Agenda Item: I.C.2, by F. O. Otorubio, Commission Paper: WFC/63/CP/I.C./2b, 9 pp., printed. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Program for Technical Assistance for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Informe al Gobierno del Ecuador sobre la Biología del Camaron (Report to the Government of Ecuador on the Biology of the Shrimp), by Robert W. Ellis, FAO Report No. 1537, 51 pp., illus., processed in Spanish, 1962.

Informe al Gobierno de Cuba sobre la Encuesta Acerca de las Pesquerías (Report to the Government of Cuba on Costs in Relation to the Fisheries), by George C. Salmon, FAO Report No. 1597, 100 pp., 1963.

Report to the Government of Nigeria on Improvements in the Bulk Smoking of Bonga in Western Nigeria, by Mieczyslaw Piatek, FAO Report No. 1756, 68 pp., 1963.

FOOD PROCESSING:

Food Processing Operations--Their Management, Machines, Materials, and Methods, by J. L. Heid and Maynard A. Joslyn, vol. 2, 605 pp., illus., printed, 1963, domestic \$19.75, foreign \$20.75. The Avi Publishing Co., Inc., P. O. Box 388, Westport, Conn. This is the second volume of a series of books which summarizes the numerous factors involved in successful food-processing operations--from the source of the raw material to the sales outlet. Whereas volume 1 covers management techniques, raw materials, facilities, and utilities, volume 2 contains comprehensive summaries by specialists of their ideas, their know-how, and their skills on processing, packaging, and legal regulations. The information is written in such a manner as to be of maximum use to any plant processing food products. Volume 2 contains 17 chapters. One chapter deals entirely with Federal and state regulation of processed foods. There are chapters on cattle, hogs, and sheep; poultry production and processing; fats and oils; use of acids in food processing; seasoning for the food manufacturer; vitamins as ingredients in food processing; preservatives and antioxidants; enzymes in food processing; metal containers for food; glass containers; flexible packaging in food processing; corrugated and solid fiber boxes; food processing by heat sterilization; processing by fermentation; and food processing by drying and dehydration. With food processing becoming more complex, this type of book will aid considerably in guiding management through some of the many complexities that have developed. With reference to fish processing, there is information on acids in frozen fish, oils for fish canning, and acids in shellfish. Each chapter contains a selected and adequate bibliography. The book has a very good index. Processors and others interested in food products

will find much that will be of value and interest in both volumes 1 and 2. (Also see Commercial Fisheries Review, August 1963, p. 135, for review of volume 1.)

--Joseph Fileggi

FRANCE:

"Les Ports du Nord Vont se Grouper en un Comité Regional des Pêches Maritimes" (The Northern Ports Want to Group Themselves into a Regional Committee of Marine Fisheries), article, France Pêche, no. 80, January 1964, pp. 41-42, printed in French. France Pêche, Boite Postale 179, Lorient, France.

FREEZING:

Freezing of Fish in Vertical Plate Freezers--Effect of Loading Procedure, by J. H. Merritt, Torry Memoir No. 150, 7 pp., printed, 1963. (Reprinted from World Fishing, September 1963.) Torry Research Station, Aberdeen, Scotland.

Freezing Meat and Fish in the Home, Home and Garden Bulletin No. 93, 23 pp., illus., printed, 20 cents, December 1963. Animal Husbandry Research Division and Human Nutrition Research Division, Agricultural Research Service, U. S. Department of Agriculture, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) As an excellent method of preserving meat and fish, freezing can be done simply and effectively at home if the products are carefully selected, prepared, and packaged; and home freezing equipment freezes quickly at 0° F. or lower, and maintains those temperatures for storage of frozen products. This booklet explains general freezing procedures; cutting and boning methods for meat; meat yields; fish selection, and cleaning and dressing; wrapping, freezing, and storing; storage periods; and thawing meats and fish.

"Immersion Freezing," by R. C. Webster and E. J. Benson, article, Food in Canada, vol. 22, no. 11, 1962, pp. 27-30, 33, printed. Maclean-Hunter Publishing Co. Ltd., 481 University Ave., Toronto 2, Canada.

FROZEN FISH:

"On the Deterioration of Frozen Fish during Storage," by J. Nishimoto, article, Memoirs of the Faculty of Fisheries, Kagoshima University, vol. 11, no. 1, 1962, pp. 41-64, illus., printed in Japanese with English summary. Faculty of Fisheries, Kagoshima University, Shimoarata-Machi, Kagoshima, Japan.

FROZEN FOODS:

Consumer Practices in the Handling and Storing of Commercially Frozen Foods, Two Cities, Two Seasons, by Ruth A. Restrom, Elizabeth Davenport, and Janet Murray, Home Economics Research Report No. 23, 29 pp., illus., printed, 20 cents, September 1963. Agricultural Research Service, U. S. Department of Agriculture, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) The research reported in this publication was undertaken to find out how frozen foods are handled and stored in the home in order to ascertain to what extent these practices might affect the quality of the food. In order to obtain data for practical use in

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educational and marketing programs, surveys of approximately 300 households were made in each of 2 cities at 2 seasons of the year. Homemakers in representative samples of families in Baltimore, Md., were interviewed in the summer of 1959 and the winter of 1960, and in Indianapolis, Ind., in the summer of 1960 and the winter of 1961. In both Baltimore and Indianapolis, data on the purchase and use of 3 groups of frozen foods--fruits, juices, and vegetables--were obtained for the 7-day period before the interview. In Indianapolis, the survey was broadened by the addition of 2 other types of frozen foods--baked goods and a meat group comprising meat, poultry, and fish or seafood--frozen plain, breaded, or with sauces--and meat dinners. From data gathered and evaluated in this study, it would appear that, in the great majority of cases, household practices alone would not be a determining factor in serious quality deterioration of frozen foods.

FUR SEALS:

Report on Canadian Pelagic Fur Seal Research in 1963, by G. C. Pike, Manuscript Report Series (Biological) No. 761, 29 pp., printed, 1963. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

GENERAL:

Weltfischwirtschaft (World Fisheries), by Wolfgang Krone, 134 pp., illus., printed 1963, DM 32 (about US\$8). Westliche Berliner Verlagsgesellschaft Heenemann KG, 102 Uhlandstrasse, Berlin 31, Germany. This book is based on the author's doctoral thesis, titled "The Fishing Industries' Contribution to Human Nutrition," and deals with the contribution fisheries can make to the Freedom from Hunger Campaign, and the future development prospects of the fishing industry on a world-wide scale. Emphasis is placed on the economic implications of fisheries development; however, both biological and technical aspects influencing fisheries are seen in close connection with the economic ones. To study the interrelation between biological, technical, and economic factors is, in fact, one of the main objects of the book. The author pleads for a more intimate collaboration among biologists, technicians, and economists in fisheries, which would certainly facilitate the solution of many problems in world fisheries. After surveying the basic biological and natural conditions of fisheries, the author discusses in a very interesting way the economic problems involved in optimum utilization of fishery resources of the sea. In view of the threat of overfishing in some areas and the ensuing regulatory measures, these problems deserve increasing attention. The author stresses that increasing care should be taken of the natural fish stock; regulatory measures should, however, take economic effects into account, and possible means of achieving those aims are described. A detailed survey of fish production, international trade and the fisheries' contribution to national income, export proceeds and human nutrition showing the economic importance of the fishing industry in different countries ends the first half of the book. The second half deals with the possibilities of achieving an increased world fish production and consumption. The author, who is optimistic as regards the biological and technical aspects of increasing fish production in developing countries, examines the favorable ef-

fects of fisheries projects on national income, employment, balance of payments, and other sectors of the economy, to prove that fisheries could make an important contribution to over-all economic progress in those countries. The practical problems encountered at any stage from the producer of fish to the retailer, and the possible ways and means of solving them, are dealt with in the conclusion of the book. The author has selected adequate statistics for his study. The book would be interesting and stimulating to people engaged, not only in fisheries, but in economics and development policies in general.

--A. Holm, Fisheries Division, O.E.C.D.

GERMAN FEDERAL REPUBLIC:

Jahresbericht über die Deutsche Fischwirtschaft, 1962/63 (Annual Report on German Fisheries, 1962/63), issued by the Federal Ministry of Food, Agriculture and Forestry in cooperation with the Federal Statistical Office, 296 pp., illus., printed in German with English table of contents and summaries, October 1963. (Available from Gebr. Mann, Hauptstrasse 26, Berlin 62, Germany.) A review covering all phases of the German fisheries in 1961/62. Part I contains information on fishery policy, legislation, the sea and coastal fisheries as well as the fish supply, the German fishing fleet, biological-statistical report on the German deep-sea fishery, and foreign trade in fishery products. Part II includes information on cruises on the fishery protection and fishery research vessels, the fishing industry and the Seamen's Vocational Association, work of the German Scientific Commission for the Exploration of the Sea, fishery research, and technical assistance program of the Federal Republic of Germany for foreign fisheries. Part III presents data on the cutter deep sea and coastal fisheries, fresh-water fisheries, and the fish meal and oil industry. Part IV gives data on foreign fisheries and whaling.

INDIA:

8th Annual Report, 1962-63, Gujarat Fisheries Central Co-Operative Association Ltd., Ahmedabad-9 India, 50 pp., illus., printed, Gujarat Fisheries Central Co-Operative Association Ltd., Ahmedabad 9, India.

INTERNATIONAL COMMISSIONS:

Annual Report for the Year 1962, 149 pp., printed, 1963. The Inter-American Tropical Tuna Commission, La Jolla, Calif.

International Commission for the Northwest Atlantic Fisheries, Annual Proceedings for the Year 1962-63, vol. 13, 46 pp., printed, 1963. International Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, Dartmouth, N.S., Canada. Presents an account of the activities of the Commission's Secretariat during the year ending June 30, 1963, including financial statements; a report of the Thirteenth Annual Meeting held June 3-7, 1963, in Halifax, N.S., Canada; and summaries of research during 1962 by Subareas.

IRRADIATION PRESERVATION:

Food Preservation by Irradiation, no. SB. 403, 11 pp., processed, 1962, Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Irradiation Nears Reality," by Joseph W. Slavin and P. Miller, article, Food Engineering, January 1964, pp. 92, 94, 98, illus., printed. Chilton Co., Chestnut and 56th St., Philadelphia 39, Pa. Commercial use of ionizing radiation for the preservation of fishery products was brought one step closer to reality with the recent start of construction of a Marine Products Development Irradiator in Gloucester, Mass. Radiation pasteurization offers promise as a means of extending the shelf life of fresh seafood. Investigations are being conducted on groundfish fillets and soft-shell clam meats at the Massachusetts Institute of Technology and the Bureau of Commercial Fisheries Technological Laboratory in Gloucester. The Atomic Energy Commission is sponsoring research on other fishery products. The Gloucester laboratory is now studying the effects of pasteurizing doses of radiation on the quality of ocean perch and cod and on the volatile compounds that comprise the flavor and odor of seafood. They are also looking into new methods of packaging irradiated products. The new irradiator at Gloucester will be used to obtain information on the commercial feasibility and cost of processing and distributing irradiated seafoods.

JAPAN:

Memoirs of the Faculty of Fisheries, Kagoshima University, vol. 12, no. 1, October 1963, 76 pp., illus., printed in Japanese with English summaries. The Faculty of Fisheries, Kagoshima University, Kagoshima, Japan. Includes, among others, these articles: "Changes of the Oil Contained in Dried Fish Muscle. I--The Effect of Packaging on the Changes of Oil," by Shigenobu Oyama; "Preventive Effect of Polyphosphate on the Drip-Formation of the Thawed Fish Flesh," by Fuyuo Ohta and Jun-ichi Nishimoto; "Studies on the Fishing Gear and the Fishing Efficiency of the Two-Boat Trawl Fishery (Preliminary Report). Some Problems on Construction of the Net Made of Manila Twine," by Nobio Higo; "The Culture of Uni-Cellular Red Algae, Porphyridium cruentum," by Koji Nozawa; and "Studies on Some Marine Algae from Southern Japan. IV," by Takesi Tanaka.

Present Status and Problems in the Water Policy for Fisheries, by Motokichi Morisawa, 42 pp., illus., printed in Japanese. Japan Fisheries Resources Association, Shiba Nishikubo Sakuragawa-cho 24, Tokyo, Japan.

Statistical Data on Frozen Fishery Products, Fiscal Year 1962, 20 pp., processed in Japanese. Japan Frozen Food Exporters' Association, Tokyo, Japan. Presents statistical tables showing data on frozen food exports in 1962; frozen tuna export validations: (1) by country of destination (January-December 1962 and for fiscal year April 1962-March 1963) and prices, (2) to United States from domestic port and by area of transshipment; and frozen tuna exports and prices to Canada, Italy, Yugoslavia, and other countries. Also contains data on frozen broadbill swordfish export validations and prices to United States; miscellaneous frozen fish and shellfish exports to United States; and miscellaneous frozen fish and shellfish exports to other countries (except United States).

"Symposium on the Bottom Trawl Fisheries in the East China and Yellow Seas," article, Nihon Suisan

Gakkai-shi, vol. 29, no. 6, June 1963, pp. 546-629, printed in Japanese. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

KOREA:

1963 Agricultural Year Book, 613 pp., illus., printed in Korean and English. The National Agricultural Co-Operatives Federation, Seoul, Korea. Includes a section of statistical tables showing data on numbers of fishing vessels, marine products, fishery population, holdings of fishing boats by district, products of aquatic culture, and processed marine products. Also includes data on imports and exports of fishery products.

LAKE TROUT:

Save the Lake Trout?, Fish Division Pamphlet No. 33, 4 pp., processed, March 1961. Fish Division, Michigan Department of Conservation, Lansing 26, Mich.

MACKEREL:

"Changes of Amino Acid Contents during Fermentation of Mackerel Muscle. 1--Examination of Assay Method for Free Amino Acids in Fresh and Fermented Muscle. 2--Amino Acid Contents of Autolysed and Fermented Ordinary Muscle of Mackerel," by N. Hoshino, article, Shokuryo Kenkyujo Kenkyu Hokoku, vol. 16, February 1962, pp. 39-46, printed in Japanese with English abstract. Food Research Institute, Fukagawa Kenkyujo, Hama Zono Cho, Koto-Ku, Tokyo, Japan.

MARINE BIOLOGY:

Books on Aquatic Biology: Fresh-Water and Marine; Prepared for the Biological Sciences Communications Project, by Carl R. Keeler, 45 pp., printed, 1963. George Washington University, Washington, D. C.

MARINE MAMMALS:

"Conservation Practices for Marine Mammals," article, Trade News, vol. 16, no. 7, January 1964, pp. 9-10, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

Marine Mammal Investigations, by John J. Burns and Loren W. Croxton, 39 pp., illus., processed, June 1963. Alaska Department of Fish and Game, Juneau, Alaska.

MEGRIM:

The Food of the Megrim, by Bennet B. Rae, Marine Research 1963 No. 3, 23 pp., printed. Department of Agriculture and Fisheries for Scotland, Aberdeen, Scotland.

MULLET:

Synopsis of Biological Data on the Grey Mullet (MUGIL CEPHALUS Linnaeus) 1758, by J. M. Thomson, Fisheries Synopsis No. 1, 1 vol., printed, 1963. Commonwealth Scientific and Industrial Research Organization, 314 Albert St., E. Melbourne C2, Australia.

NATURAL RESOURCES:

Natural Resources and International Development, edited by Marion Clawson, 473 pp., printed, 1964, \$7.50. The Johns Hopkins Press, Baltimore, Md., 21218. The relationship between natural resources

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and economic growth in broad regions of the world; the interdependence between resources and the techniques, policies, and institutions that control their usability; and the contribution that wise resource management can make to the economic growth of a nation is what this book is about. Samplings of some of the best thought on the conservation, development, and use of natural resources as they relate to economic growth on a world scale are presented in ten essays (presented at the 1963 Forum of Resources for the Future, Inc.). Of particular interest to members of and all those interested in the fishery industries is the essay on "Food and the World Fisheries Situation," by Anthony D. Scott, Department of Economics and Political Science, University of British Columbia. In the very first sentence the author points out: "The contribution that fisheries development can make to international economic development is probably small compared with that to be expected from agriculture and mining. But the word 'probably' is important, for the rational exploitation of the seas is still in its infancy." In the second paragraph the author makes the further qualification: "We are just beginning to assess the seas' full potential productivity." Then the author goes on to point out that when better developed the seas will be an important source of food, and that this resource can be relied upon to expand and continue. The essay is concerned with this aspect of international economic development. Covered in the essay are the growth of demand; supply from the standpoint of indicated productivity of the ocean and potential productivity (discusses fishing gear and equipment); and increasing the productivity of the oceans. The essay concludes with a discussion of the biology and economics of overfishing and patterns of international cooperation. Of the ten essays in the book, three are on commodities--fisheries, agriculture, and oil; four focus on resource problems in regions of the world (Western Europe, the Soviet Union, Africa, and Latin America); and the final three concern the potentialities and hazards of foreign investment for resource development, the terms of trade between raw material exporting and importing countries, and the transfer of knowledge and capital across national boundaries. The book is adequately indexed. Considering the interest in conservation today, this is a timely and thought-provoking book.

--Joseph Pileggi

NORTHEAST ATLANTIC:

North-East Atlantic Fisheries Convention, London, January 24, 1959 (The United Kingdom instrument of ratification was deposited on August 27, 1959, and the Convention entered into force on June 27, 1963), Treaty Series No. 68, printed, 30 cents, 1963. British Information Services, 845 3rd Ave., New York 22, N. Y.

NORTHWEST ATLANTIC FISHERIES:

Northwest Atlantic Fisheries, Declaration of Understanding between United States and Other Governments Regarding Convention of February 8, 1949, Signed Washington April 24, 1961, 7 pp., printed, 5 cents, 1963. U. S. Department of State, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.)

OCEANOGRAPHY:

Data from the First Plenum of the Section on Underwater Research, Oceanographic Commission, OTS 63-31934, 77 pp., printed, \$2, October 14, 1963. (Translated from the Russian, Okeanograficheskaya Komissiya, Trudy, vol. 14, 1962, pp. 5-6, 76-107, 116-130.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

Journal du Conseil, vol. XXVIII, no.2, September 1963, 156 pp., illus., printed in French and English, single copy Kr. 16 (about US\$2.30.) Andr. Fred. Host & Son, Bredgade, Copenhagen, Denmark. Includes, among others, articles on: "The Food of the Irish Sea Herring in 1961 and 1962," by A. L. Rice; "Incidence of Clostridiosis in Scottish Herring," by Z. Kabata; "The Influence of Egg Size on Herring Larvae (Clupea harengus L.)," by J. H. S. Blaxter and G. Hempel; "On the Relative Fishing Power of Dutch Trawlers," by J. J. Zijlstra and J. F. deVeen; "Marine Fish Culture in Britain. IV--High Survivals of Metamorphosed Plaice during Salinity Experiments in Open Circulation at Port Erin, Isle of Man, 1961," by J. E. Shelbourne; "Marine Fish Culture in Britain. V--An Electronic Device for Counting the Nauplii of Artemia salina L.," by R. B. Mitson; "Preliminary Observations on the Relationship between Growth, Spawning and Condition in Experimental Colonies of Venus mercenaria L.," by A. D. Ansell and F. A. Loosmore; and "Studies on the Age and Growth, Fecundity and Spawning of Osteogobius militaris (Linn.)," by V. Rayappa Pantulu.

Oceanographical Observations in the Indian Ocean in 1961, H.M.A.S. DIAMANTINA (Cruise Dm 2/61), Oceanographical Cruise Report No. 9, 172 pp., illus., processed, 1963. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

Oceanographical Observations in the Pacific Ocean in the Pacific Ocean in 1961, H.M.A.S. GASCOYNE (Cruise G 1/61), Oceanographical Cruise Report No. 8, 147 pp., illus., processed, 1963. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

"Oceanography," article, Current Affairs Bulletin, vol. 32, no. 13, November 11, 1963, pp. 195-208, illus., printed, single copy 6d. (about 10 U. S. cents). Current Affairs Bulletin, The University of Sydney, Sydney, Australia.

OCEAN PERCH:

"Identity of Larval Redfish Populations in the North Atlantic," by G.T.D. Henderson, article, Nature, vol. 201, no. 4917, January 25, 1964, p. 419, illus., printed. St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

OCTOPUS:

"Notes on the Laboratory Culture of the Octopus Larvae," by K. Itami and others, article, Nihon Suisan Gakkai-shi, vol. 29, no. 6, June 1963, pp. 514-520, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

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OREGON:

Biennial Report, July 1, 1960-June 30, 1962, to the Governor and the Fifty-Second Legislative Assembly, 34 pp., illus., printed, limited distribution. Fish Commission of Oregon, 307 State Office Bldg., 1400 SW. 5th Ave., Portland 1, Oreg. Discusses the accomplishments of the Oregon Fish Commission's Research Division, including albacore investigations, otter trawl investigations, hatchery biology investigations, Columbia River Fishery Development Program, coastal rivers investigations, mark analysis investigation, fish passage research, troll salmon investigations, and shellfish investigations. Also discusses the Commission's work in fish culture, engineering, development of water resources, and information and education. Includes statistical tables showing data on liberations of salmon into Oregon streams, egg taking at hatcheries, licenses issued, fish landings, and law enforcement.

History of the Oregon Trawl Fishery, 1884-1961, by George Y. Harry, Jr. and Alfred R. Morgan, 22 pp., illus., printed. (Reprinted from Research Briefs, Fish Commission of Oregon, vol. 9, no. 1, May 1963, pp. 5-26.) Fish Commission of Oregon, 307 State Office Bldg., 1400 SW. 5th Ave., Portland 1, Oreg. Early records show that between 1884 and World War II several attempts were made to start a trawl fishery but it did not flourish until the war created a demand for bottomfish. Since the war the Oregon fishery has been maintained at various levels of production. Many gear improvements have been introduced. The average size of fishing vessels has increased and larger engines, heavier otter doors, and drums with greater cable capacity have been installed. More instrumentation has been added to aid the trawl fisherman. Some boats have abandoned ice for refrigeration in favor of chilled sea water in tanks. Trawlers have tended to move farther from their home ports although fishing trips are still only about 3 to 5 days. The time per tow has increased in recent years to 3 or 4 hours on some grounds. Fish landings have fluctuated in response to market conditions. The peak trawl fishery in numbers of boats and pounds landed occurred during World War II, followed by a severe decline in landings in the early 1950's and slow recovery in the late 1950's.

OYSTERS:

"Historical Notes on the Oyster Fisheries of Ireland," by Arthur E. J. Went, article, Proceedings of the Royal Irish Academy, vol. 62, sec. C, no. 7, August 1962, pp. 195-223, illus., printed, 3s. (about 45 U.S. cents). Hodges, Figgis and Co., Ltd., 6 Dawson St., Dublin, Ireland.

Studies on Oysters in Relation to the Oil Industry, by J. G. Mackin and S. H. Hopkins, 319 pp., printed, 1962. Institute of Marine Science, Port Aransas, Tex.

PACIFIC OCEAN:

The Principal Hydrological Features of the Pacific Ocean, by A. M. Muromtsev, OTS 63-11065, 421 pp., illus., processed, 1963. (Translated from the Russian, Osnovnye Cherty Gidrologii Tikhogo Okeana.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

PACKAGING:

"Recent Experiments with the Packaging of Unfrozen and Smoked Fish," by J. M. Shewan and G. Hobbs, article, Fishing News, no. 2585, 1963, pp. 7, 12, printed. A. J. Heighway Publications Ltd., 110 Fleet Street, London EC4, England.

PARASITES:

The Incidence of Larvae of PORROCAECUM DECIPIENS in the Flesh of Cod, by Bennet B. Rae, Marine Research 1963 No. 2, 28 pp., printed. Department of Agriculture and Fisheries for Scotland, Aberdeen, Scotland.

PEARL CULTURE:

"Growing Pearl Oysters in Tanks," by Edith Landau, article, New Scientist, vol. 20, no. 368, December 5, 1963, pp. 618-619, illus., printed, single copy 1s. (about 15 U.S. cents). Cromwell House, Fulwood Pl., High Holborn, London WC1, England. The cultivation of pearl oysters in water tanks, conducted in 1963 in the National Pearl Research Laboratory at Kashikojima, Japan, opens the possibility of liberating pearl cultivation from such hazards as typhoons and tidal waves. Pearl oysters (Pinctada martensii Dunker) grew in 6 culture tanks of aerated sea water and were fed daily on a diet of diatoms. Researchers believe that the promising results of their trials warrant a more comprehensive project aimed at improving culture equipment and the feeding mechanics, as well as comparing growth rates achieved with different nutrients.

PERU:

Peruvian Fisheries Number - 1963 - of the Peruvian Times, October 28, 1963, 59 pp., illus., printed, s/. 25.00 (about 93 U. S. cents). Peruvian Times, S. A., Jiron Carabaya 928, Office 304, P. O. Box 531, Lima, Peru. A special annual issue devoted to the fisheries of Peru and containing articles on the expansion of the Peruvian fisheries industry; 1962 exports of fishery products; anchovy fishery off Peru; IV Annual Conference of the International Association of Fish Meal Manufacturers, held at Lima, October 28-31, 1963; declaration of Peru of 200-mile territorial waters; regulation of fishing permits for foreign vessels; statistical tables giving data on landings and exports of fishery products, 1957-1962; directory of the National Fisheries Association; and fishing vessels at Callao. Also presents information on fish-meal reduction plants, a trip in a purse seiner, malnutrition in Peru, a visit to the fishing villages of Sechura Bay, aerial fish-spotting, land-based whaling station near Paíta, activities of the Peruvian Fisheries Service, the Marine Resources Research Institute, the origin of trout hatcheries in Peru, and the Cabo Blanco big game fishing.

"La Pesca in Peru--Como se Desarrolló una Gran Industria Nacional" (Peruvian Fishing Industry--How a Great National Industry was Developed), by Roberto Lecca Pardo, article, Puntal, vol. X, no. 116, November 1963, pp. 4-7, illus., printed in Spanish. Puntal, Apartado de Correos 316, Alicante, Spain.

PHYSIOLOGY:

"A New Apparatus for Measuring the Course of Rigor Mortis in Fish and Mammalian Muscles," by G. N. Karlsruhe, article, Fleischwirtschaft, vol. 15, no. 1,

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1963, pp. 21-23, illus., printed in German with English, French, Italian and Spanish summaries. Verlagshaus Sponholz, 14/16 Neue Mainzerstrasse, Frankfurt a/M, Germany.

PLANKTON:

The Net Phytoplankton Taken in Virginia Tidal Waters January-December 1962, by Richard A. Mulford, Special Scientific Report No. 43, 22 pp., illus., printed, 1963. Institute of Marine Science, Gloucester Point, Va.

POND FISHERIES:

Hydrobiological Studies on the Artificially Constructed Ponds ("Tameike" Ponds) of Japan, by Toshihiko Mizuno, 125 pp., printed, 1961. (Reprinted from Japanese Journal of Limnology, vol. 22, 1961.) Otsu Hydrobiological Station, Kyoto, Japan.

PORPOISES:

"Iz Opyta Promyslovogo Lova Del'finov" (On the Experience Gained in Commercial Fishing for Porpoises), by A. I. Petrenko, article, Rybnoe Khoziaistvo, vol. 38, no. 3, 1962, pp. 44-48, illus., printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

PORTUGAL:

"Artes de Pesca na Area Maritima do Sul" (The Art of Fishing in the Maritime Area of the South), by Jorge Teles de Faria Correia Bastos, article, Boletim da Pesca, vol. XV, no. 81, December 1963, pp. 11-69, illus., printed in Portuguese. Gabinete de Estudos das Pescas, R. S. Bento, 644, 4^o Esq., Lisbon, Portugal.

"La Pesca en Portugal en 1962 y la Industrial Conservera" (The Fishery in Portugal in 1962 and the Canning Industry), article, Boletim de Informacion del Sindicato Nacional de la Pesca, nos. 62-63, November-December 1963, pp. 10-11 printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6^a Planta, Madrid, Spain.

SALMON:

Annual Fish Passage Report, North Pacific Division, Bonneville, The Dalles, McNary and Ice Harbor Dams, Columbia and Snake Rivers, Oregon and Washington, 1962, 73 pp., illus., processed, 1963. U. S. Army Engineer District, Portland, Oreg.

Annual Report, 1962, 55 pp., printed, 1963. Skeena Salmon Management Committee, Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

"Barge Block to Save Salmon," article, Outdoor California, vol. 25, no. 2, February 1964, pp. 3-6, illus., printed. Documents Section, Printing Division, P. O. Box 1612, Sacramento, Calif., 95807. Describes the partial blocking of the San Joaquin River with a 130-foot barge loaded with 600 tons of sand to aid in breaking up pollution blocks. Also discusses the accomplishments of the California Department of Fish and Game in salmon conservation in the California Central Valley.

On the Biology of Primorsky Pink Salmon, ONCORHYNCHUS GORBUSCHA (Walbaum), by O. V. Vasil-

enko-Lukina, Circular 197, 8 pp., illus., processed, July 1963. (Translated from the Russian, Voprosy Ikhtologii, vol. 2, no. 4, 1962, pp. 604-608.) Fisheries Research Institute, College of Fisheries, University of Washington, Seattle 5, Wash.

Data Report, Salmon Tagging Experiments in Prince William Sound 1960-1961, by Wallace Noerenberg and David G. Savoie, Informational Leaflet 28, 38 pp., illus., processed, December 1963. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska.

New Data on the Migration of Pink Salmon in the Sakhalin Area, by P. A. Dvinin, OTS 63-11103, 4 pp., illus., processed, 1963. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 34, no. 1, 1958, pp. 12-15.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

"Questions and Answers about Atlantic Salmon," by Paul F. Elson, article, The Atlantic Salmon Journal, no. 3, December 1963, pp. 8-9, illus., printed. The Atlantic Salmon Association, 1559 McGregor St., Montreal 25, Canada.

"Restoration of a North Shore Salmon River," by C. R. Smith, article, The Atlantic Salmon Journal, no. 3, December 1963, pp. 3-7, illus., printed. The Atlantic Salmon Association, 1559 McGregor St., Montreal 25, Canada. Discusses salmon stock rehabilitation in the Great Watchichou River, in the Province of Quebec about 500 miles northeast of Quebec City and 175 miles from Seven Islands.

"The Salmon Fishery in the U.S.S.R.," by Boris Tarasyuk, article, The Atlantic Salmon Journal, no. 3, December 1963, pp. 18-20, illus., printed. The Atlantic Salmon Association, 1559 McGregor St., Montreal 25, Canada. Discusses measures taken in the Soviet Far East to protect spawning salmon; field stations concerned with salmon escapement and other research work in Kamchatka, Sakhalin, the Amur region, the Okhotsk coast, and the Maritime region; and salmon river improvement. Also covers the reduced salmon escapement in many rivers; artificial spawning of salmon in hatcheries; artificial feeding of salmon fingerlings; and the need of regulation of commercial fishing in order to provide sufficient escapement to allow the improvement of Pacific salmon stocks.

Salmon of the North Pacific Ocean. Part II--Review of Oceanography of the Subarctic Pacific Region, by A. J. Dodimead, F. Favorite, and T. Hirano, Bulletin No. 13, 198 pp., illus., printed, 1963. International North Pacific Fisheries Commission, 6640 NW Marine Dr., Vancouver 8, B. C., Canada.

SALT FISH:

Review of Salted Fish Production and the European Markets, 1962-63 Season, 44 pp., printed, 1963. Hawes and Company Ltd., London, England.

SARDINE:

Synopsis on the Biology of the Sardine (SARDINELLA AURITA Valenciennes) (African Atlantic), by E. Postel, FAO Fisheries Biology Synopsis No. 6, 49 pp., illus., processed in French, distribution restricted, 1960. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

SCALLOPS:

Report of Scallop Bed Reconnaissance Work Carried Out by the Scallop Dragger OCEAN SWELL, by George Imbeault, 6 pp., illus., printed, 1963. Canadian Department of Fisheries, Ottawa, Canada.

SCARIDAE:

"On the Fishes of the Family Scaridae of Japan, Including the Riu Kiu Islands," by T. Kamohara, article, Reports of the Usa Marine Biological Station, vol. 10, no. 1, June 1963, pp. 1-24, printed. Usa Marine Biological Station, Oita Prefecture, Usa, Japan.

SEALS:

"The Hawaiian Monk Seal," by Dale W. Rice, article, Natural History, vol. LXXIII, no. 2, February 1964, pp. 48-55, illus., printed, single copy 50 cents. The American Museum of Natural History, Central Park W. at 79th St., New York, N.Y., 10024.

Protocol to Extend the Provisions of the International Convention for the Northwest Atlantic Fisheries Signed at Washington on February 8, 1949, to Harp and Hood Seals, Washington, July 15, 1963 (The Protocol has not been ratified by the United Kingdom), Miscellaneous No. 18, printed, 20 cents, 1963. British Information Services, 845 3rd Ave., New York 22, N. Y.

SHAD:

Surface Trawl Surveys to Determine the Abundance of Juvenile American Shad (ALOSA SAPIDISSIMA) in the Pamunkey and Mattaponi Rivers, 1952-1956, by W. H. Massmann, Special Scientific Report No. 46, 8 pp., printed, 1963. Institute of Marine Science, Gloucester Point, Va.

SHARKS:

Distribution of Sharks in the Canadian Atlantic (with Special Reference to Newfoundland Waters), by Wilfred Templemen, Bulletin No. 140, 77 pp., printed, 1963. Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

The Dogfish Shark, a Photographic Study, by Addison E. Lee and others, 38 pp., illus., printed, 1963. Holt, Rinehart, and Winston, Inc., 383 Madison Avenue, New York, N. Y. 10017. The purpose of this atlas is twofold. It can serve as an adjunct to a laboratory manual and thus be of aid to students in locating structures which otherwise might be difficult to find, and in correctly identifying the structures of the dogfish shark. In addition, the atlas can be used as a study guide both to familiarize the student with the structures before dissection, and to review them afterward. The authors believe that photographs are superior to drawings for use by beginning students, since photographs are more realistic and demonstrate precisely the actual relationships among the anatomical structures. The atlas has been arranged according to systems, since this arrangement is the one adopted in a large number of comparative anatomy courses. Because the dogfish is used to introduce the student to fundamental structures of vertebrates, those structures have been photographed which the authors feel are most valuable for a competent understanding of basic anatomy. The atlas covers the external anatomy, digestive system,

mesenteries, female urogenital system, male urogenital system, circulatory system, heart and associated vessels, notochord and associated structures, eye, inner ear, and brain.

SMALL BUSINESS MANAGEMENT:

Helping Small Firms Develop and Exploit New Products, by Delmar W. Karger and Andrew B. Jack, Management Research Summary, 4 pp., illus., processed, 1963. Small Business Administration, Washington, D. C. 20416. Results of this study show that small manufacturers can be helped by a program of conferences on basic management followed by individual counseling. Firms taking part in the study had a 15-percent increase in sales during the 18-month project. Sales of a control group dropped 8 percent during the same period.

Profits and Competition in Retail Food Pricing, by Lee E. Preston, Reed Hertford, and Jim D. Likens, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington D. C. 20416. A retailer should develop pricing guides based on his costs and the tastes and incomes of his customers. The percentage of markup should be determined on the basis of how demand for the item responds to changes in price. "Market-basket pricing" considers the impact of the price of an item on total store sales and profits. A survey of 14 supermarkets found that each firm, while responding to market pressures, was able to maintain some independence and thus to develop varied profit opportunities.

SMOKING:

Fish Smoking, by G. H. O. Burgess and A. McK. Bannerman, 44 pp., printed, 60 cents, 1963. British Information Services, 845 3rd Ave., New York 22, N. Y. The Torry kiln was developed in 1939 in an attempt to produce a fish-smoking kiln capable of turning out a high quality uniform product without the disadvantages of the traditional kiln. Although the Torry kiln has now been widely adopted by the British fish-smoking industry the Torry Research Station believes that the commercial operation of the kilns could be improved. This handbook gives advice to the kiln operator and to management. It will be useful both to the operator and to individuals who want to know whether or not to install a kiln of this type.

SOUTH AFRICAN REPUBLIC:

Sixteenth Annual Report of the Director, 1962, 107 pp., printed, 1963. Fishing Industry Research Institute, Cape Town, South Africa Republic.

SOUTH AMERICA:

Anuario de Pesca (Yearbook), 1962-1963, 287 pp., illus., printed in Spanish, \$7. Ediciones Sudamerica S. A., Av. Wilson 911, Oficina 304, Apartado 2218, Lima, Peru. Contains articles on: "Las 2 Caras de Sudamerica" (The 2 Faces of South America); "Horizontes Oceanicos de Sudamerica" (Oceans' Horizons of South America), by Zacarias Popovici; "Recursos Marinos en Chile, Ecuador y Peru" (Marine Resources of Chile, Ecuador, and Peru), by Robert Clark; "Chile--Grandes Planes" (Chile--Great Plans); "Argentina; Vacas contra la Pesqueria" (Argentina: Cattle Against Fisheries); "Uruguay, el Estado-Pescador" (Uruguay, the Fishermen's State); "Brasil para los

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Brasileno" (Brazil for the Brazilians); "Venezuela, Mar de Recursos Desconocidos" (Venezuela, Sea of Unrecognized Resources); and "Colombia Tiene Mar Pero no Pesca" (Colombia Has a Sea but no Fishery); "Ecuador, Grande en Atun y Camaron" (Ecuador, Great in Tuna and Shrimp); "Peru: Pura Anchoveta" (Peru: Pure Anchovies); "La Pesca Peruana en Cifras" (The Peruvian Fishery in Figures), by Isaac Vasquez; "Harina y Aceite, Industrias Grandes: (Meal and Oil, Great Industries), by Nicolas Corrochano V. A directory of the Peruvian fishing industry includes sections on fishing firms, producers of fish meal and oil, producers of canned fish, producers of frozen fish, manufacturers of whale meal and oil, suppliers for the fishing industry, and the Peruvian anchovy fishing fleet.

SOUTH CAROLINA:

Annual Report, 1962-1963, Contributions from Bears Bluff Laboratories No. 39, 10 pp., illus., printed, January 1964. Bears Bluff Laboratories, Wadmalaw Island, S. C. (Reprinted from Report of South Carolina Wildlife Resources Department, Fiscal Year July 1, 1962-June 30, 1963.) Discusses the accomplishments of the Bears Bluff Laboratory during the year ended June 30, 1963, covering the study of oysters, shrimp, finfish, and pond cultivation. Also covers hazards of pesticides to the fisheries, the formation in South Carolina of an oystermen's association, a cooperative oceanographic cruise, and construction of a new research vessel.

SPAIN:

"La Exportacion de Galicia en 1962. II--Análisis Global" (Exports from Galicia in 1962. II--Over-All Analysis), article, Industrias Pesqueras, vol. 37, no. 877, November 1, 1963, pp. 433-434, printed in Spanish, single copy 40 ptas. (about 65 U. S. cents). Industrias Pesqueras, Policarpo Sanz, 21-2^o, Vigo, Spain. Shows exports of canned fishery products 1957-1962.

"La Exportacion Gallega de Conservas de Pescados" (Galicia's Exports of Canned Fishery Products), article, Industria Conservera, vol. 29, no. 293, November 1963, pp. 310-313, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

"La Produccion Pesquera Espanola en 1963--Perspectiva Global" (Spanish Fishery Production in 1963--Over-All View), by Mareiro, article, Industrias Pesqueras, vol. XXXVIII, no. 881, January 1, 1964, pp. 8-9, printed in Spanish, single copy 50 ptas. (about 85 U.S. cents). Industrias Pesqueras, Policarpo Sanz 21-2^o, Vigo, Spain.

SPOILAGE:

Autolytic Changes in the Lipids of Fish Flesh, by J. A. Lovern, Torry Memoir No. 106, 8 pp., illus., printed. (Reprinted from Recent Advances in Food Science, 1962, pp. 194-201.) Torry Research Station Aberdeen, Scotland.

"Degradation of Adenine- and Hypoxanthine-Nucleotide in the Muscle of Chill-Stored Trawled Cod (Gadus callarias)," by N. R. Jones and J. Murray, article, Journal of the Science of Food and Agriculture, vol. 13, 1962, pp. 475-480, illus., printed. The Society of Chemical Industry, 14 Belgrave Square, London SW1, England.

STERN TRAWLERS:

"Germany's Newest Stern Trawler," article, Fishing News, no. 2586, 1962, p. 3, illus., printed. Suite 27, 110 Fleet St., London EC4, England.

"A New Trawler to Solve Some Problems," by C. Birkhoff, article, Fishing News International, vol. 1 no. 3, 1962, pp. 46-49, illus., printed. A. J. Highway Publications Ltd., 110 Fleet St., Ludgate House, London EC4, England.

"The Stern Trawler, Pionero," article, Shipping World, vol. 147, no. 3600, 1962, p. 110, illus., printed. Shipping World, 127 Cheapside, London EC2, England.

SUBMARINES FOR FISHERY RESEARCH:

"Soviet Research by Submarine," article, World Fishing, vol. 13, no. 1, January 1964, pp. 40-41, illus., printed, single copy 3s. (about 42 U.S. cents). Gramplan Press Ltd., The Tower, 229-243, Shepherds Bush Rd., Hammersmith, London W6, England. Reviews the history of the use of submarines for fishery research and discusses the conversion of a Soviet Navy submarine for this purpose. This consisted of removal of torpedo tubes and substitution of a scientific laboratory; addition of 3 portholes and a television camera for observation, echo-sounders, a direction-finder, and an instrument for instantaneous measurement of water temperature and salinity. Instruments for taking samples of the bottom, for measuring illumination, and for analyzing sea water were also added. The submarine became operative in December 1958.

"Soviet Research by Submarine. Part Two--Observing Herring Underwater," article, World Fishing, vol. 13, no. 2, February 1964, pp. 45-48, illus., printed, single copy 3s. (about 45 U.S. cents). Gramplan Press Limited, The Tower, 229-243, Shepherds Bush Rd., Hammersmith, London W6, England. Describes activities of the Soviet fisheries research submarine, Severyanka, in the Barents Sea during 1958-59. Observations were made of plankton densities, as well as activities of herring shoals. Variable light sensitivity in herring was demonstrated.

SUCKERS:

Suckers, by Frank J. Schwartz, Educational Series No. 58, 6 pp., illus., printed. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

SYMBIOSIS:

Symbiotic Behavior between Small Fishes and Jellyfishes, with New Data on that between the Stromateid, PEPRIUS ALEPIDOTUS, and the Scyphomedusa, CHRYSAORA QUINQUECIRRHA, by Romeo Mansueti, Contribution No. 216, 41 pp., illus., printed. (Reprinted from Copeia, no. 1, March 1963, pp. 40-80.) Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

TAIWAN:

Fishermen's Association in Taiwan, by J. L. Chen, FAO Occasional Paper 63/15, 3 pp., printed, 1963. Regional Office for Asia and the Far East, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

TARIFF AND TRADE:

Operation of the Trade Agreements Program, 14th Report, July 1960-June 1962, TC Publication 120, 163 pp., processed, 1964. Secretary, U. S. Tariff Commission, Washington, D. C., 20436. During the period covered by the 14th report, the Contracting Parties to the General Agreement on Tariffs and Trade (GATT) sponsored multilateral tariff negotiations. At the 1960/62 GATT tariff conference, negotiations were conducted with respect to: (1) the common external tariff of the European Economic Community, (2) new or additional concessions by some of the contracting parties, (3) concessions by certain countries acceding to GATT, and (4) revision of certain existing concessions by some of the contracting parties. The report also covers major developments relating to the general provisions and administration of the GATT, actions of the United States relating to its trade agreements program, and major commercial policy developments in countries with which the United States has trade agreements.

TAXONOMY:

The Genera of Fishes and a Classification of Fishes, by David Starr Jordan, 816 pp., printed, 1963, \$17.50. Stanford University Press, Stanford, Calif. This is a reissue of an outstanding work, "The Genera of Fishes." Although long recognized as a classic in zoological taxonomy, it has been out of print since the early 1930's. However, the reissue has been coupled with the publication of "A Classification of Fishes." Together these two works have been the bible of two generations of ichthyologists and have been instrumental in achieving a stable nomenclature and a general classification of both fossil and living forms. Today Jordan's works still remain a prime reference tool for the taxonomist. The new Foreword by George S. Myers, Stanford University, sets the work in the perspective of today's knowledge. Thus a guide is provided for correlating newer names and groups with those of Jordan's classification. "The Genera of Fishes" consists of four parts: Part I--From Linnaeus to Duvier, 1758-1833; Part II--From Agassiz to Bleeker, 1833-1858; Part III--From Guenther to Gill, 1859-1880; Part IV--From 1881-1920. "A Classification of Fishes" places each genus and subgenus, living and fossil, named or described, whether valid or not, in its proper family and the families themselves are arranged in as natural a sequence as is possible with a linear series which embraces highly divergent lines of evolution. The book also contains a comprehensive Index, printed here for the first time although used in manuscript form for 20 years. This book is indispensable to any research involving the zoological nomenclature and bibliography of fish. It is a must for any reference library on fish and fisheries.

--Joseph Pileggi

TELEOSTS:

"Electron Microscopic Observation on Liver of Teleost, *Ctenochaetus striatus*," by T. Kantani, article, Yamaguchi-Igaku, vol. 12, no. 1, March 1963, pp. 35-40, printed in Japanese. Yamaguchi Imai, Igakkai, Ogushi, Ube, Yamaguchi, Japan.

"Electron Microscopic Observation on Stomach of Teleost, *Ctenochaetus striatus*," by T. Yokota, article, Yamaguchi-Igaku, vol. 12, no. 1, March 1963, pp. 14-19, printed in Japanese. Yamaguchi Imai, Igakkai, Ogushi, Ube, Yamaguchi, Japan.

TOXICITY:

"Fish Poisoning. A Problem in Food Toxication," by A. F. Bartsch and E. F. McFarren, article, Pacific Science, vol. 16, 1963, pp. 43-56, printed. Office of Publications, University of Hawaii, Honolulu 14, Hawaii.

TRAWLERS:

"Le Chalutier-Usine Russe Leskof de 2670 T.J.B." (The Russian Factory-Trawler Leskof of 2,670 Metric Tons), article, La Peche Maritime, vol. 42, no. 1027, October 1963, pp. 690-692, illus., printed in French, 12 F (about US\$2.45). Les Editions Maritimes, 190, Boulevard Haussmann, Paris, France.

TROUT:

This Wonderful World of Trout, by Charles K. Fox, 296 pp., illus., printed, \$7.50, 1963. Foxcrest, Carlisle, Pa.

TROUT AND SALMON:

Trout and Salmon Culture (Hatchery Methods), by Earl Leitritz, Fish Bulletin No. 107, 213 pp., illus., printed in Japanese with English references, reprinted January 1960. Printing Division, Documents Section, N. Seventh St. at Richards Blvd., Sacramento 14, Calif.

TUNA:

Observations on the Economy of the Tuna Fisheries, 69 pp., illus., printed in Japanese, limited distribution, August 1963. Fishery Agency, Tokyo, Japan.

"Practical Considerations on Green Discoloration of Tropical Tuna," by J. F. Aldrin, article, Revue de la Conserve, vol. 17, no. 7, 1962, pp. 147-151, printed in French. Societe d'Edition pour l'Alimentation, rue de la Reale, Paris I, France.

Some Technological Aspects of the Norwegian Tuna Purse Seining Fishery, by Johannes Hamre, 14 pp., illus., printed. (Reprinted from Reports on Norwegian Fishery and Marine Investigations, vol. 13, no. 6, 1963.) Fiskeridirektoratet, Bergen, Norway. Gives an account of the development of the Norwegian tuna fishery, including a brief description of the purse-seine method used at present, and a consideration of its efficiency compared to the American technique. Discusses the construction of the net, the fishing operation, the sinking velocity and the operation depth of the net, and some theoretical considerations on net constructions. The combination of a short but strong bunt with a long wing made of very light material has enabled the Norwegian fishermen to construct a purse seine strong enough to hold a giant bluefin and at the same time be manageable for the fishing operation. The object in choice of net design is to obtain the largest catching capacity of the net for the smallest cost of material and power requirement under actual fishing conditions.

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"Test Purse Seining for Tuna Using the Fish Boat Thynnus," by C. G. du Plessis, article, The South African Shipping News and Fishing Industry Review, vol. XLIX, no. 1, January 1964, pp. 86-87, 89, 91-93, illus., printed, single copy 30¢ (about 45 U.S. cents). Thomson Newspapers, South Africa (Pty.) Ltd., 8th Floor, Trust House, Thibault Sq., Box 80, Cape Town, South Africa Republic. The purpose of experiments carried out with the Thynnus was to establish whether tuna could be caught in South African waters with a purse seine operated from a standard local type of pilchard fishing vessel. The vessel is 61 feet long, 42.19 net tons, and of wooden construction. Fishing was conducted between mid-July 1962 and mid-August 1963 off the coast of South Africa. Because of bad weather, only 6 throws were made, none of which was successful. However, the Fisheries Development Corporation of South Africa has decided to continue the work pioneered by the Thynnus, and has recently enlisted the part-time services of a 72-foot pilchard fishing boat.

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. XII, no. 2, February 1964, 32 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G. M., Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, these articles: "The Sponges (Part I);" "The Postmortem Changes in Turkish Sea-Water Fishes (Part I);" and "Basic Researches on the Development of Fishery in Turkish Fresh-Waters, Lakes and Dams (Part II)."

UNITED ARAB REPUBLIC:

Selling in the United Arab Republic, by Roger D. Severance, OBR 63-160, 8 pp., printed, 15 cents, December 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) With a few exceptions, foreign suppliers selling in the U.A.R. deal with the Government. Fifteen government trading or import companies, supervised by the Egyptian General Trade Organization under the Ministry of Economy, have the responsibility for importing all goods that are not imported directly. The report discusses the road to selling--representation, direct selling, import requirements, consumer goods, industrial goods, and transportation, port, and storage facilities; commercial practices (wholesale and retail channels, credit terms and facilities, and trade customs); and market aids (advertising media, market research and trade organizations); and United States aids. Also covers Government procurement; selling under United States programs--A.I.D. loans, P. L. 480 assistance, export insurance, and export guarantees; and notes for business travelers.

U.S.S.R.

Notes from Soviet Fisheries Journals, no. 7, by Donald E. Bevan and Ole A. Mathisen, Circular No. 192, 26 pp., illus., processed, May 1963. Fisheries Research Institute, College of Fisheries, University of Washington, Seattle 5, Wash. Includes, among others, these items: "Strengthening and Developing International Relations in the Field of Fisheries;" "Biological Data on Pink Salmon Transplanted to White Sea and the Barents Sea;" "A Review of the Work of the Fishing Industry in 1962;" "Experiments on Transplantation of the Pacific Shrimp to the Black Sea;" "Catch of Flounder in the Bering Sea."

Rybnoe Khoziaistvo, vol. 50, no. 1, January 1964, 96 pp., illus., printed in Russian, single copy 50 Kopecks (about 56 U. S. cents). Rybnoe Khoziaistvo, B-140, V. Krasnosel'skaia 17, Moscow, U.S.S.R. Includes, among others, articles on: "Let Us Increase the Catches of Fish;" "The Further Development of Pond Fish Culture in the U.S.S.R.;" "For a Rational Organization of Herring Fishing in the White Sea," by I. I. Bagautdinov; "The Structure of the Sturgeon Catch in the Caspian Sea," by N. I. Kozhin; "Efficacy of Measures to Increase the Ladoga Salmon Stocks," by Z. A. Boiarskaia; "Method of Unloading Vessels in the Open Sea without Moorings," by S. M. Rudnitskii; "Improved Rigging of 15/21 Trawl Used in Ocean Perch Fishing," by B. K. Zhukov; "The Introduction of Purse Seining on the SRTR-400 Rubtsovsk," by Iu. Moskal'tsov; "How to Lower the Costs of Trap Nets;" and "Rational Exploitation of the Fishery Resources," by F. I. Baranov.

--M.A. Kravanja

Rybnoe Khoziaistvo, vol. 50, no. 2, February 1964, 95 pp., illus., printed in Russian, single copy 50 Kopecks (about 56 U. S. cents). Rybnoe Khoziaistvo, B-140, V. Krasnosel'skaia 17, Moscow, U.S.S.R. Includes, among others, these articles: "Fishermen and the 7-Year Plan;" "Biological Principles of the Fishery Regulations in the Sea of Azov," by A. N. Smirnov and V. M. Naumov; "A Method to Determine the Abundance of Atlantic Salmon in the Pechora River," by O. A. Azernikova; "The Effect of Temperature Factor in the Culture of Young Salmon," by I. N. Petrenko; "More Attention to the Mechanization of Loading and Unloading Operations in Fishery Ports," by T. P. Shumilova; "A Trawl for Shrimpers," by V. S. Dolbish and others; "A New Refrigerated Plant in the Fishing Port of Nakhodka," by V. I. Matveev; and "Fish-Freezing Plant Aboard Vessel," by V. K. Vasil'ev.

--M.A. Kravanja

Translations from RYBNOYE KHOZYAYSTVO (Fishing), No. 1, 1962, OTS 63-31096, 26 pp., illus., processed, 75 cents, 1963. (Translated from the Russian, Rybnoye Khozyaystvo, no. 1, January 1962, pp. 9-13, 26-32, 32-36.) Office of Technical Services, U. S. Department of Commerce, Bldg., T-30, Ohio Dr. and Independence Ave. SW., Washington, D.C., 20235. Includes articles on: "Saury," by S. I. Apanovich; "Quantitative Assay of Baltic Cod Concentrations by Means of a Sonic Depth Finder," by K. I. Yudanov; and "Underwater Observations of the Behavior of the Caspian Kilka," by I. V. Nikonorov.

VESSELS:

"All-Aluminum Menhaden Vessel," by Joe D. Smith, article, Fishing News International, vol. 2, April-June 1963, pp. 151-152, printed. A. J. Heighway Publications Ltd., 110 Fleet Street, London EC4, England.

"Problems Associated with the Development of Fisheries in Tropical Countries. I--Mechanization of Fishing Boats," by R. C. Cole and L. H. Greenwood-Barton, article, Tropical Science, vol. 4, no. 3, 1962, pp. 127-146, illus., printed. Tropical Products Institute, 56/62 Grays Inn, London WC1, England.

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Refrizheratornyye Suda (Refrigerator Ships), by V. P. Zaitsev, R. 28287, printed in Russian, 1963. (Available on loan from the National Lending Library for Science and Technology, D.S.I.R., Boston Spa, Yorkshire, England.)

VIRGIN ISLANDS:

An Analysis of the Fish Populations of Artificial and Natural Reefs in the Virgin Islands, by John E. Randall, 18 pp., printed. (Reprinted from Caribbean Journal of Science, vol. 3, no. 1, March 1963, pp. 31-47.) University of Puerto Rico, Faculty of Arts and Sciences, Institute of Caribbean Science, Mayaguez, P. R.

VOCATIONAL EDUCATION:

Fishing, Choice of Careers No. 90, 40 pp., printed, 1961. Her Majesty's Stationery Office, York House, Kingsway, London WC2, England

WATER RESOURCES:

"Water Resources Research in the Federal Government," by Roger Revelle, article, Science, vol. 142, no. 3595, November 22, 1963, pp. 1027-1033, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. N.W., Washington, D.C., 20005.

WESTERN PACIFIC:

Sbornik Dokladov po 2 Plenumu Komissii po Rybokhoziaistvennomu Issledovaniuu Zapadnoi Chasti Tikhogo Okeana (Collection of Papers Read at the Second Plenum of the Commission on the Study of Fish Economy of the Western Part of the Pacific), edited by P. A. Moiseev, R. 28159, printed in Russian, 1962. (Available on loan from the National Lending Library for Science and Technology, D.S.I.R., Boston Spa, Yorkshire, England.) Komissiiia po

Rybokhoziaistvennomu Issledovaniuu Zapadnoi Chasti Tikhogo Okeana.

WHALES:

Killer Whale!, by Joseph J. Cook and William L. Wisner, illus., printed, \$3, 1963. Dodd, Mead and Co., 432 Fourth Ave., New York, N. Y., 10016.

WHALING:

"International Whaling Commission (Chairman's Report of the Fifteenth Meeting)," by M. N. Sukhoruchenko, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 53, no. 1, January 1964, pp. 1-6, 8, printed. Hvanfangerforeningen, Sandefjord, Norway. Discusses the agenda and accomplishments of the Fifteenth Meeting of the International Whaling Commission, July 1-6, 1963, London. Covers a review of the previous season's catch, the condition of the Antarctic whale stocks, the blue-whale unit limit, protection of humpbacked whales and blue whales, and the Antarctic baleen whaling season. Also covers the North Pacific whale stocks, size limits for sperm whales, taking of whales for scientific purposes, the observer scheme, infractions, finance, and other business.

WHITE SEA:

Biology of the White Sea. Works of the White Sea Biological Station, Moscow University, Vol. 1, 1962, (Review), by V. G. Bogorov, OTS 63-31661, 2 pp., printed, 50 cents, August 30, 1963. (Translated from the Russian, Zoologicheskii Zhurnal, vol. 42, no. 6 1963, p. 967.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

WHITING:

The Scottish Whiting Fishery in the North Sea 1955-60, by Ray Gambell, Marine Research 1963, No. 4, 31 pp., printed. Department of Agriculture and Fisheries for Scotland, Edinburgh, Scotland.



GIANT BOULDER LANDED BY BRITISH TRAWLER

A four-ton boulder (considered to be the largest ever to be brought up by conventional trawl gear) was landed at Grimsby in late 1963 by the British trawler Okino. Taken from the fishing area known as the "Silver Pits" in the North Sea, the boulder has probably caused damage to fishing gear for years. It took seven hours to stow on deck, a hazardous undertaking which could have sunk the vessel if the rock had dropped. The cost to the trawler owners was well over £100 (US\$280) in lost time and fish. But only two meshes were broken in the cod-end which was made of synthetic fiber of great strength.

Another demonstration of the strength of synthetic fiber was the netting of a 2½-ton boulder in a polypropylene trawl by the British trawler Ross Mallard in December 1962.

Note: See Commercial Fisheries Review, May 1963 p. 89.

QUESTIONS FREQUENTLY ASKED ABOUT CANNED FOODS

Consumers frequently ask the Food and Drug Administration these questions about canned foods:

1. Where should I store canned foods? Canned foods may be stored any place. The best storage is in a dry place at moderately cool, but not freezing, temperatures. Storage near steam pipes, radiators, furnaces, and kitchen ranges should be avoided.

2. How long will canned foods keep? Canned foods will keep just as long as nothing happens to the can or jar to make it leak. Extremely long periods of storage at high temperatures may result in some loss in color, flavor, appearance, and nutritive value, but the foods will remain wholesome. It is probably best to have a regular turnover, say, once a year.

3. What effect has freezing on canned foods? There may be a slight breakdown of texture of a few products, but otherwise a single freezing and thawing does not affect canned foods adversely. Some creamy foods may curdle or separate upon freezing, but heating usually restores the original consistency.

4. Does damage to the outside of a can mean the food is damaged? Rust or dents do not affect the contents of the can as long as the can does not leak. However, any container that leaks or bulges should be discarded.

5. Is it safe to leave unused portions of canned foods in the can after opening? Yes, it is safe to leave food in the open can. It is important, however, to place the can in the refrigerator, just as you would any other cooked food. Acid foods, such as grapefruit juice, may dissolve a little iron from the open can if it stands in the refrigerator for any long period of time. This metal is not harmful or dangerous to health, but the food may have a metallic taste. If such a product is not going to be consumed within a short time, it probably would be preferable to empty the contents into a glass jar or other container.

6. What about the composition of cans themselves? I sometimes notice discoloration in the food or in the liner of the can. The Food Additives Amendment to the Federal Food, Drug, and Cosmetic Act prohibits the use of food containers which would transfer a poisonous or harmful substance to the food in the can. Consumers may be confident of the safety of the cans found in the market.

However, a harmless discoloration sometimes does occur either in the can liner or in the food itself. This is one example: during the processing necessary for sterilization, some vegetables and meats liberate sulfur. This often causes a mottling of the inside surface of the can, in various shades of brown, blue, or black. This is due to the formation of tin sulfide and sometimes also iron sulfide. Food scientists state, however, that the sulfide stain does not harm the contents, and is merely unsightly. (FDA Memo for Consumers from the Food and Drug Administration, U. S. Department of Health, Education, and Welfare, February 10, 1964.)

PORPOISE AND DOLPHIN RAVAGE FISHERMEN'S CATCH AND GEAR

The porpoise and his larger cousin, the dolphin, are often thought of as man's best friends in the sea. Fond of humans, remarkably intelligent, incurable show-offs, both those mammals are popularly painted as playful princes of the deep. This view is not shared by the fishermen of the Mediterranean. From Barcelona to Beirut, from Trieste to Tripoli, porpoise and dolphin alike are detested as pests, robbers, and natural enemies of all who make their living from the sea.

A study of the General Fisheries Council of the Mediterranean (GFCM), written by C. Ravel of France and published recently through the Food and Agriculture Organization, gives the reasons for the fishermen's hostility.

Here are a few: Porpoise and dolphin annually destroy or seriously damage thousands upon thousands of fishing nets--not only nets used near the shore but trawls working over the continental shelf at depths up to 400 feet.

Year after year those animals chase away schools of tuna the fishermen have sometimes tracked for days.

Porpoise and dolphin feed on diminishing stocks of sardine, anchovy, sole, and other fish that make up the bulk of the Mediterranean catch.

Italian fishermen report that porpoise alone cost them about \$500,000 a year in destroyed or damaged nets. The French estimate damage to gear at \$400 per boat for the Mediterranean fishing fleet. The Spaniards say the porpoise damages or destroys up to 20,000 items of gear a year. Dolphin are a major threat to the prize bluefin tuna fisheries off Morocco's north coast. Yugoslavia, with an average of 3,000 nets ruined and 6,000 damaged, reckons its yearly losses to those animals at about \$270,000.

What is doubly galling to the fishermen is that the porpoise and the dolphin have public sympathy on their side. Any Mediterranean-wide campaign against them would probably set off a chain of protests. Admiration for the porpoise and the dolphin goes back to ancient times. Greeks and Romans saw the dolphin as a noble, even divine, creature. Homer called the dolphin "the King of Fishes and Lord of the Sea." He also said that to hunt the dolphin was sinful and displeasing to the Gods. Pliny cited the dolphin as a savior of drowning men and a fierce fighter of crocodiles in the Nile.

Despite the porpoise-dolphin's established public relations image, the fishermen do what they can in their own defense. They use a variety of attacks:

Porpoises and dolphins are shot with rifles--without much real effect on their numbers. Underwater detonators and grenades scare them away but seldom kill them. Poisons are poured in the sea where they are thought to collect--usually without impressive results. Ultrasonic wave emitters frighten them away from fishing boats--temporarily. Once the echo-sounders are shut off, the "divine creatures" come swarming back. Other methods are tried--with indifferent success.

The GFCM study offers one solution: eat them. Ravel's study says that "porpoise hunting might perhaps be intensified if porpoise meat could be marketed in the ordinary way."

He points out that although porpoise meat is little eaten in his own country (its bright red color is considered shocking), there is no reason why the meat could not achieve popularity.

"It tastes very good, rather like venison. Certain cuts--fillet, tongue, brains, liver and kidney--are special delicacies. In other countries, such as England and Italy, porpoise meat is highly esteemed and eaten quite normally.

"In Canada," the study continues, "canned dolphin meat is an enormous success, so that its poor reputation elsewhere is quite undeserved and ought to be changed. Porpoise meat should find the place it used to enjoy on the market and this would probably be the best way of keeping down the numbers of those animals."

A good way of combatting the *Tursiops* species of dolphin, Ravel recommends, is to "harpoon them on sight." Thus Mediterranean fishing boats, especially those engaged in tuna and sardine fishing, would do well to keep harpoons aboard "so as to deal with the *Tursiops* when they start prowling around the boat."

Of all the Mediterranean nations only Turkey has really gone after the dolphin properly. The Turks hunt the animal with military rifles from motor boats of 20 to 150 horsepower. Each rifleman is issued 1,500 bullets and in years when there are plenty of dolphin the Turks may kill from 5,000 to 8,000 tons.

"Turkey, therefore," the study states, "has organized dolphin hunting in a truly systematic, businesslike fashion, so that the predators do not overabound in Turkish waters and thus do not cause serious damage to the fishermen's nets."

Significantly the Turks like porpoise and dolphin meat and its marketing helps out a great deal in supplying the population with high-grade protein.

Ravel's final recommendation is the use of underwater acoustic signals. As porpoise and dolphin are known to communicate with one another by such signals, he thinks that it may soon be possible to keep them at bay by transmitting their own alarm or distress signals.

"In other circumstances," his study concludes, "different signals might be used to attract those creatures to specific points, so that they may be caught and killed by the appropriate means."



SOLAR STILLS PURIFY SEA WATER IN INDIA

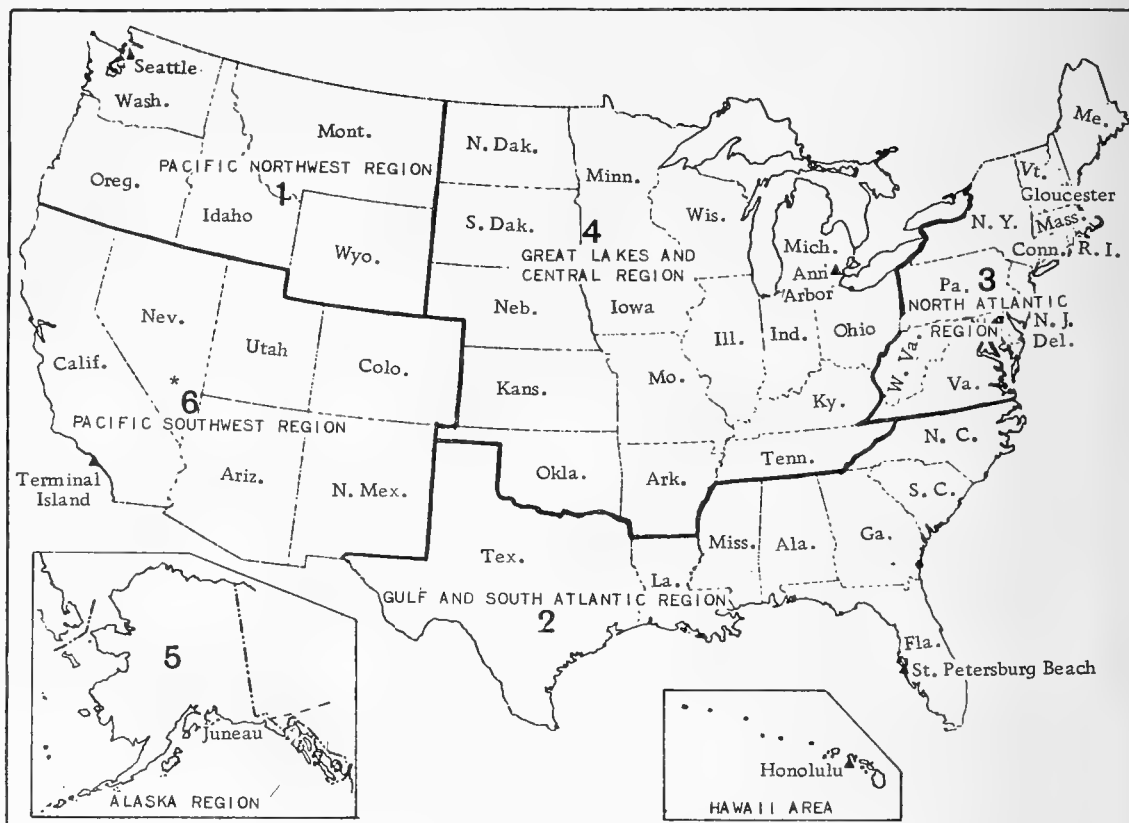
In northern India where the sun shines brightly most of the year, methods for evaporating and distilling water in solar stills are being studied. The stills are in general airtight glass-roofed enclosures exposed to the sun in which brackish water or sea water is allowed to evaporate and condense along the walls. The distilled water is then collected in troughs along the sides of the still. Experiments so far have indicated that a low-roof type of solar still is the most practical in the remote arid areas where the only water supply is underground brackish water.

The yield from the stills is fairly constant and installation fairly inexpensive. About 14 to 20 square feet of distilling area is required to produce a gallon of distilled water per day. A daily yield of about 1,500 gallons per acre would be sufficient to maintain a village community of about 250 persons.

The study was reported in the Indian Journal of Scientific and Industrial Research, ("Science News Letter," 83:30, January 12, 1963.)

U. S. BUREAU OF COMMERCIAL FISHERIES

The U. S. Bureau of Commercial Fisheries and the agencies that preceded it have a history of interest in the country's fisheries which extends back to 1871. In 1939, fishery activities were transferred from the U. S. Department of Commerce to the U. S. Department of the Interior and consolidated with the Bureau of Biological Survey to form the Fish and Wildlife Service.



Regional and area boundaries, U. S. Bureau of Commercial Fisheries.

The Fish and Wildlife Act of 1956 provided, in the U. S. Department of the Interior, a Fish and Wildlife Service composed of the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries. This Act recognized fish and shellfish as a valuable resource, important to the Nation's future. It also directed the Bureau to manage wisely the marine resources and to help maintain a strong and prosperous fishing industry.

As a result of the Fish and Wildlife Act of 1956, the activities of the Bureau of Commercial Fisheries were regionalized to establish closer contact at the field level.

ROBERT J. STUBBS
COMMERCIAL FISHERIES REVIEW

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Fishes



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JUNE 1964

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Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington, D. C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
 prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
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5/31/68

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SHRIMP EXPLORATIONS OFF VANCOUVER ISLAND (BRITISH COLUMBIA) BY M/V JOHN N. COBB, OCTOBER-NOVEMBER 1962

By Lael L. Ronholt*

ABSTRACT

Sixty trawl drags were made in 30 to 105 fathoms between Cape Beale and Cape Cook. Three species of commercially important pandalid shrimp were found: the pink shrimp (*Pandalus jordani*), side-stripe shrimp (*Pandalopsis dispar*), and spot shrimp (*Pandalus platyceros*).

The best catches were made off Barkley Sound where 150 pounds of pink shrimp were taken in a one-half hour drag. Of the remaining 59 drags, 3 produced 50 pounds of pink shrimp, 6 yielded from 25 to 50 pounds, and 48 caught less than 25 pounds. Two drags failed, owing to gear damage.

For all drags the number of pink shrimp, heads-on, ranged from 95 to 182 per pound.

INTRODUCTION

From October 15 to November 16, 1962, the U. S. Bureau of Commercial Fisheries conducted a five-week exploratory shrimp cruise aboard the research vessel John N. Cobb. Explorations extended along the southwest coast of Vancouver Island, from Cape Beale northward to Cape Cook in 30 to 100 fathoms. The primary purpose of the cruise was to locate and delineate commercial concentrations of shrimp and trawlable ground previously unknown to the commercial fishing fleet. Secondary objectives were to collect data on the life history and size of the shrimp inhabiting these waters.

BACKGROUND

Although commercial shrimp fishing has not been conducted off the west coast of Vancouver Island, commercial fisheries for the pink shrimp (*Pandalus jordani*) have developed off Washington and Oregon. During the first two years of the fisheries, Washington shrimp landings rose rapidly to 6,729,000 pounds, but from 1958 to 1960 the yearly catch decreased to 1,805,000 pounds (table 1). The Oregon fishery was also characterized by a rapid rise in landings during the first two years. In 1959, 2,425,000 pounds of shrimp were landed, but in 1960 the catch decreased to 1,136,000 pounds. The decline in the Washington-Oregon shrimp landings, although not fully documented, is apparently the result of changes in the competitive economic status of the fishery combined with a reduction in catch per unit of effort and fishing intensity during the most recent years.

Table 1 - Shrimp Landings off Oregon and Washington, 1955-60¹

| | 1960 | 1959 | 1958 | 1957 | 1956 | 1955 |
|------------------|--------------------------|-------|-------|-------|------|------|
| | (1,000 Lbs.) | | | | | |
| Oregon | 1,136 | 2,425 | 1,523 | 495 | 6 | - |
| Washington . . . | 1,805 | 2,998 | 6,729 | 2,458 | 76 | 8 |

¹/Source: Pacific Marine Fisheries Commission, mimeographed report, December 1, 1961.

Results of shrimp explorations conducted off Oregon and Washington by the Oregon Fish Commission and the U. S. Bureau of Commercial Fisheries have been published elsewhere

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(Alverson, McNeely, and Johnson 1960; Pruter and Harry 1952; Ronholt and Magill 1961; Schaefers and Johnson 1957).

Prior work off Vancouver Island by the Bureau consisted of 8 Gulf shrimp trawl drags made off Barkley Sound and Pachena Point in 60 to 118 fathoms. Two drags, in 60 to 69 fathoms, produced from 300 to 400 pounds of pink shrimp per hour fished. The eight drags produced an average catch of 92 pounds of pink shrimp and 11 pounds of the side-stripe shrimp per hour (Alverson, McNeely, and Johnson 1960).

Explorations were conducted off the west coast of Vancouver Island by the Fisheries Research Board of Canada in 1955 (Butler and Dubokovic 1955). The area explored extended from off the Strait of Juan de Fuca to Cape Scott in 48 to 100 fathoms. Sixty-two drags were made with a small-mesh shrimp otter trawl. Results indicated that shrimp were not available in sufficient quantities to support a commercial fishery. Although the catch rates in some areas were comparable to established, inshore, small-boat fisheries, the availability did not appear great enough to support operations with larger vessels required to fish the offshore grounds. Greatest availability was found off Nootka Sound where one drag resulted in a catch rate of 324 pounds per hour. The shrimp taken during those explorations were quite small, averaging about 200 heads-on-shrimp to the pound.

During 1959, the Fisheries Research Board of Canada conducted further explorations off Nootka Sound (Butler, 1959). Five drags were made with a small-mesh shrimp trawl in 64 to 75 fathoms. Four drags produced 795, 348, 216, and 120 pounds of pink shrimp per hour. The availability of shrimp was higher than in 1954, and the number of heads-on-shrimp per pound ranged from 178 to 286. The shrimp taken at the southern end of the Nootka grounds were larger than those taken at the northern end.

REGION EXPLORED

The offshore region of Vancouver Island was selected for shrimp explorations because (1) no commercial shrimp fishing was being conducted in that area, (2) prior explorations had indicated the possibility of shrimp concentrations, and (3) the area lies adjacent to the known shrimp grounds off the Washington coast.

The Continental Shelf is relatively narrow, measuring approximately 40 miles in width off Cape Beale at the southern end, and 5 miles off Cape Cook at the northern end. The substrate is predominantly green mud, with some green sand or a mixture of green sand and mud. Trawlable grounds were intermingled with rough, rocky regions.

GEAR AND METHODS

FISHING GEAR: A Gulf-of-Mexico flat shrimp trawl measuring 43 feet along the foot rope (Schaefers and Johnson, 1957) was used at all stations. The net was constructed of 1½-inch mesh throughout.

The trawl doors were 2½ by 5 feet, and weighed about 160 pounds each. Dandyline gear was not used, as the net was fastened directly behind the doors. Twenty-fathom bridles connected the doors to a single warp.

METHODS: The sampling procedure was designed to cover the 50- to 100-fathom depth interval. Two series of drags were alternated throughout the region as fishing conditions permitted. One series was made from 50 to 100 fathoms at 10-fathom intervals, the second from 55 to 95 fathoms at 10-fathom intervals.

Before fishing the net, a sounding transect was made of the area. During the sounding transect the depth recorder marks a permanent "trace," which shows the bottom configuration and indicates whether the bottom is soft or hard. When the recording revealed that the bottom was trawlable, the net was fished. All drags, with one exception, were 30 minutes long. Time was calculated from the time the net reached the bottom until retrievals were started. An attempt was made to maintain a constant depth during each drag.

The shrimp catch in each drag was analyzed by species. Representative samples of the commercially important species were frozen for examination ashore.

The associated fish catch was analyzed by species for: (1) number of individuals, (2) total weight, and (3) minimum and maximum length. Length frequencies were taken for some commercially important species.

RESULTS

In 60 drags, made between Cape Beale and Cape Cook in 30 to 105 fathoms, no concentrations of shrimp were found that, at this time, could be considered commercially exploitable.

Table 2 - Catch-Depth Relationship for the Pink Shrimp (*Pandalus jordani*) Taken from Cape Beale to Cape Cook

| Depth Range in Fathoms | Number of Half-Hour Drags | Number of Half-Hour Drags Containing Shrimp | Total Shrimp Catch (in Pounds) | Average Catch (in Pounds) Per Half-Hour Drag |
|------------------------|---------------------------|---|--------------------------------|--|
| 30-39 | 1 | 0 | 0 | 0 |
| 40-49 | 1 | 0 | 0 | 0 |
| 50-59 | 3 | 2 | t | t |
| 60-69 | 15 | 15 | 148 | 10 |
| 70-79 | 16 | 16 | 198 | 18 |
| 80-89 | 16.47 | 15.47 | 332 | 15 |
| 90-99 | 5 | 5 | 34 | 9 |
| 100-109 | 1 | 1 | 9 | 9 |
| Total | 58.47 | 54.57 | 721 | 12 |

t - ("trace") equals less than one pound.

The pink shrimp (*Pandalus jordani*) was the dominant species, and the largest catch was 150 pounds of pink shrimp from a half hour drag in the area off Barkley Sound. The number of pink shrimp (heads-on per pound) ranged from 95 to 182, and the average catch per half-hour by depth ranged from 0 to 18 pounds (table 2). Other commercially utilized species found were side-stripe shrimp and spot shrimp. For ease of discussion the region explored has been divided into the three following areas: Barkley Sound, Amphitrite Point to Esteban Point, and Esteban Point to Cape Cook.

BARKLEY SOUND: Ten drags were made off Barkley Sound in depths from 60 to 90 fathoms (fig. 1). Four drags produced pink shrimp at a higher rate than 25 pounds per half hour. The highest catch (drag number 1) was 150 pounds per half hour. Drag number 4 took 50 pounds; and drags number 59 and 60 produced 46 and 42 pounds, respectively. Pink shrimp were in highest numbers in the 80- to 89-fathom depth interval. Four drags in that depth range produced an average of 56 pounds per half hour (table 3).

Side-stripe and spot shrimp were also taken off Barkley Sound. Side-stripe shrimp were taken in 9 drags at rates from 1 to 7 pounds per half hour, with drag number 59

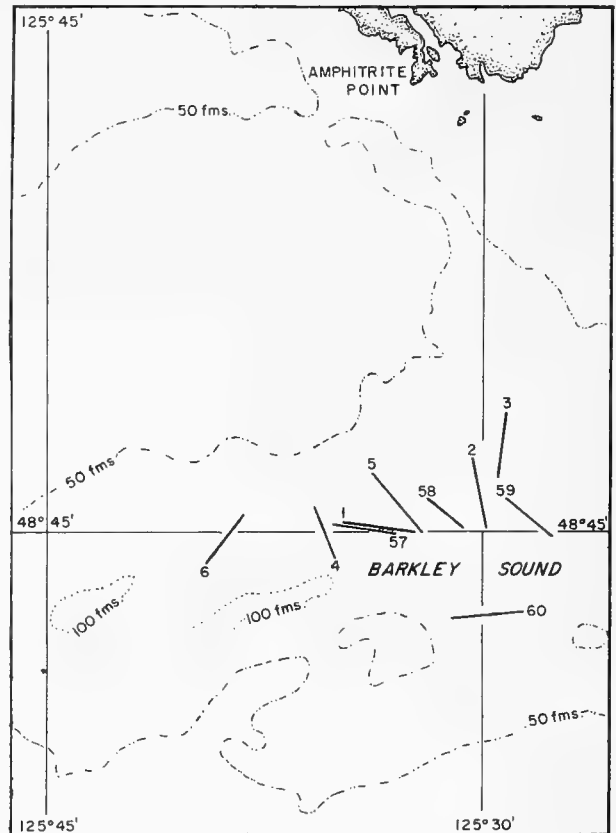


Fig. 1 - Gulf shrimp trawl drags off Barkley Sound.

Table 3 - Catch-Depth Relationship for the Pink Shrimp (*Pandalus jordani*) Taken off Barkley Sound

| Depth Range in Fathoms | Number of Half-Hour Drags | Number of Half-Hour Drags Containing Shrimp | Total Shrimp Catch (in Pounds) | Average Catch (in Pounds) Per Half-Hour Drag |
|------------------------|---------------------------|---|--------------------------------|--|
| 60-69 | 3 | 3 | 48 | 16 |
| 70-79 | 3 | 3 | 71 | 24 |
| 80-89 | 4 | 4 | 224 | 56 |
| Total | 10 | 10 | 343 | 34 |

producing the largest catch. Three specimens of spot shrimp were taken in drags number 59 and 60.

AMPHITRITE POINT TO ESTEBAN POINT: Twenty-four drags were made between Amphitrite Point and Esteban Point in depths from 30 to 109 fathoms (fig. 2). Only 4 drags pro-

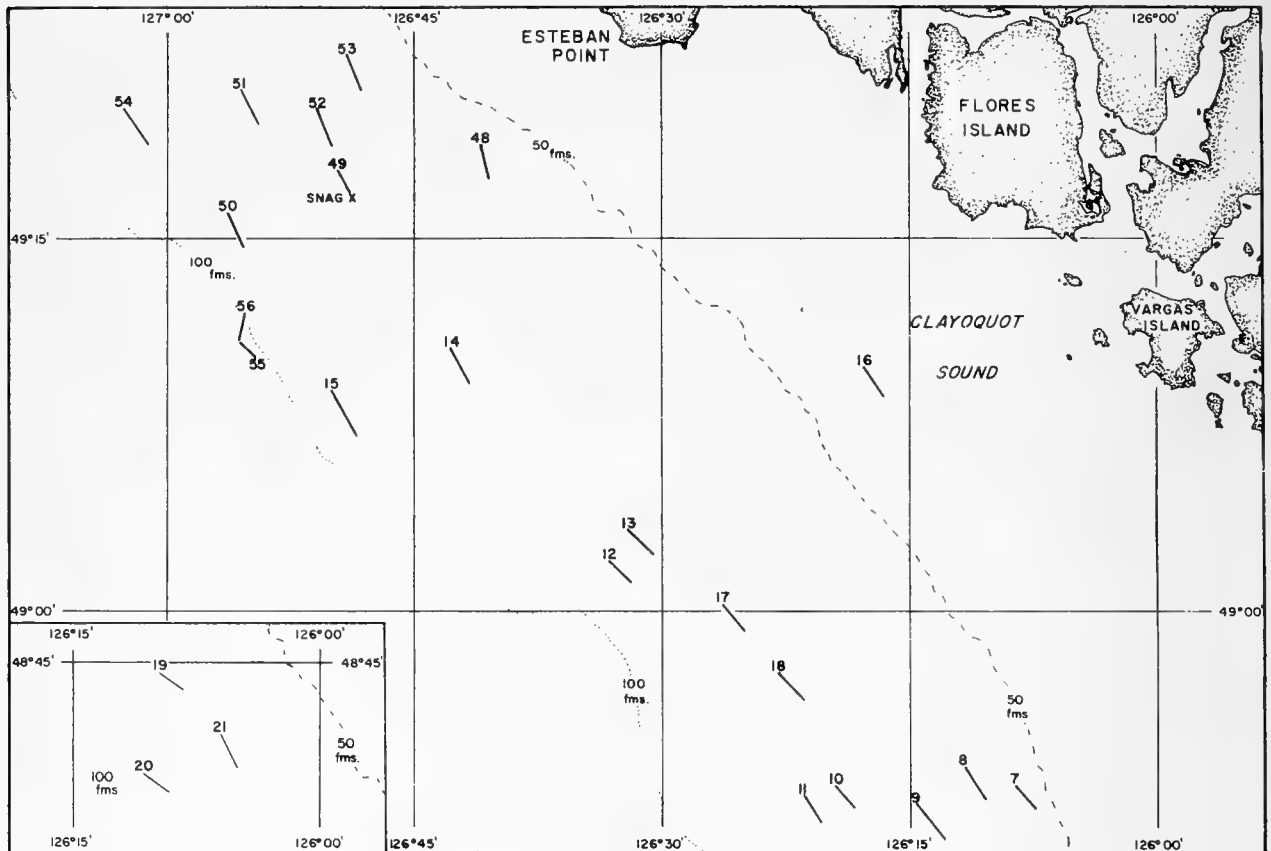


Fig. 2 - Gulf shrimp trawl drag between Amphitrite Point and Esteban Point.

Table 4 - Catch-Depth Relationship for the Pink Shrimp (*Pandalus jordani*) Taken from Amphitrite Point to Esteban Point

| Depth Range in Fathoms | Number of Half-Hour Drags | Number of Half-Hour Drags Containing Shrimp | Total Shrimp Catch (in Pounds) | Average Catch (in Pounds) Per Half-Hour Drag |
|------------------------|---------------------------|---|--------------------------------|--|
| 30-39 | 1 | 0 | 0 | 0 |
| 40-49 | 0 | 0 | 0 | 0 |
| 50-59 | 1 | 1 | t | t |
| 60-69 | 4 | 4 | 6 | 2 |
| 70-79 | 6 | 6 | 95 | 16 |
| 80-89 | 7.47 | 7.47 | 108 | 15 |
| 90-99 | 2 | 2 | 29 | 15 |
| 100-105 | 1 | 1 | 9 | 9 |
| Total | 22.47 | 21.47 | 247 | 11 |

t - ("trace") equals less than one pound.

duced pink shrimp at a rate of 25 pounds or more per half hour. Drags number 10 and 52 produced 50 pounds per half hour and drags number 11 and 13 yielded 25 pounds per half hour. The shrimp were most available in the 70- to 79-fathom depth interval, where six drags produced an average catch of 16 pounds per half hour (table 4). Two drags were not successful because of gear damage.

Side-stripe shrimp were not found in that area, but six specimens of spot shrimp were taken in drag number 12.

ESTEBAN POINT TO CAPE COOK: Twenty-six drags were made between Esteban Point and Cape Cook in 40 to 99 fathoms (fig. 3). Two drags, numbers 46 and 47, produced 30 and 40 pounds, respectively. The remaining 24 drags produced less than 25 pounds per half hour. The highest catches occurred in the 60- to 69-fathom depth range where eight drags produced an average catch of 12 pounds per half hour (table 5).

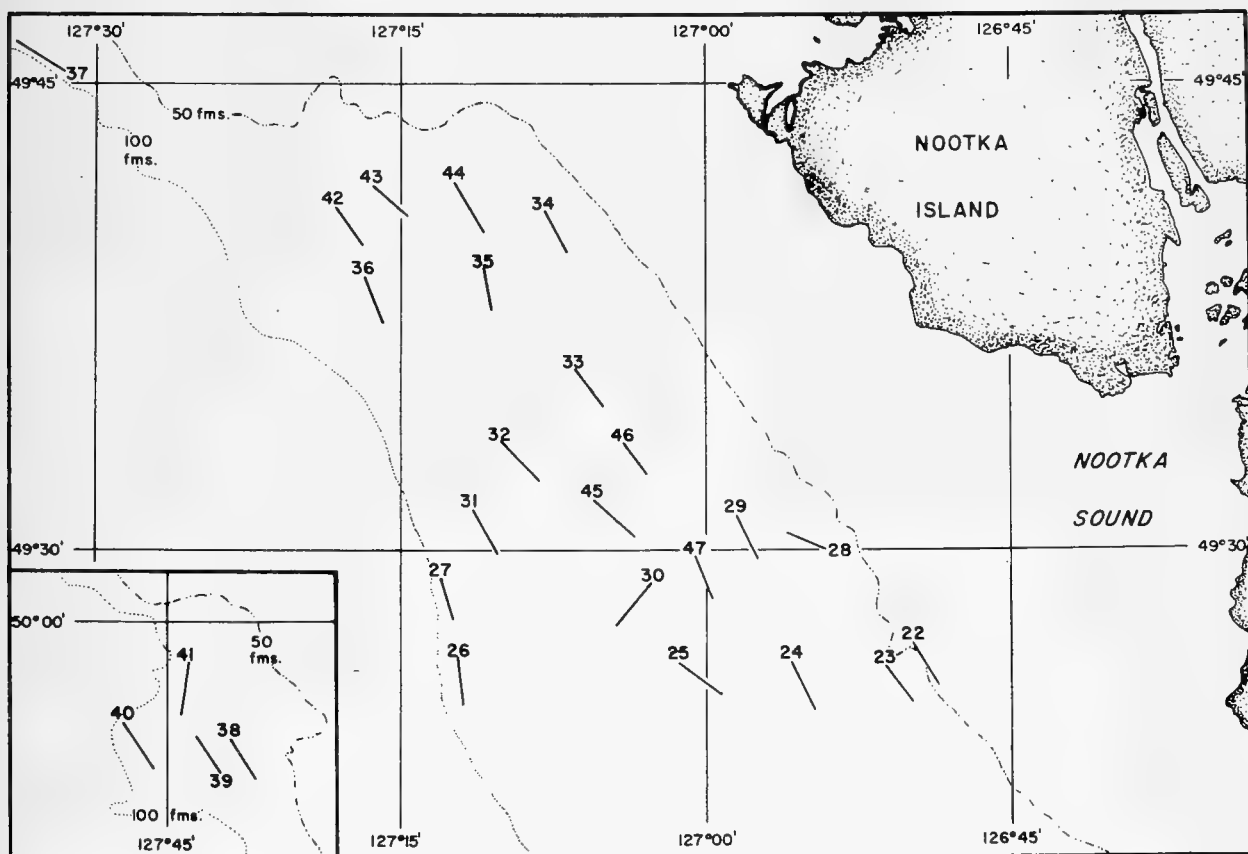


Fig. 3 - Gulf shrimp trawl drags north of Esteban Point.

Table 5 - Catch-Depth Relationship for the Pink Shrimp (*Pandalus jordani*) Taken from Esteban Point to Cape Cook

| Depth Range in Fathoms | Number of Half-Hour Drags | Number of Half-Hour Drags Containing Shrimp | Total Shrimp Catch (in Pounds) | Average Catch (in Pounds) Per Half-Hour Drag |
|------------------------|---------------------------|---|--------------------------------|--|
| 40-49 | 1 | 0 | 0 | 0 |
| 50-59 | 2 | 1 | t | t |
| 60-69 | 8 | 8 | 94 | 12 |
| 70-79 | 7 | 7 | 5 | 1 |
| 80-89 | 5 | 4 | 30 | 6 |
| 90-99 | 3 | 3 | 6 | 2 |
| Total | 26 | 23 | 135 | 5 |

t - ("trace") equals less than one pound.

Side-stripe shrimp were not found in that region; however, 1½ pounds of spot shrimp were caught during drags number 40 and 41.

FISH CATCH: Fish catches, which ranged from 1 to 412 pounds, were dominated by flatfish and elasmobranchs, which accounted for 46.6 and 34.9 percent, respectively, of the total fish catch (table 6). Ratfish and turbot were the two dominant species, constituting 29.6 and 26.6 percent of the total fish catch.

Table 6 - Species of Fish Encountered Showing Total Pounds Caught, Average Catch Per Half-Hour, and Percent of Total Fish Catch Based on 58.5 (30-Minute) Drags

| Common Name | Scientific Name | Total Pounds | Average Catch (in Pounds) Per Half-Hour Drag | Percentage of Total Fish Catch |
|---|----------------------------------|--------------|--|--------------------------------|
| Flatfish: | | | | 46.6 |
| Turbot | <u>Atheresthes stomias</u> | 1,678 | 28.7 | 26.6 |
| Dover sole | <u>Microstomus pacificus</u> | 522 | 8.9 | 8.3 |
| Rex sole | <u>Glyptocephalus zachirus</u> | 420 | 7.2 | 6.7 |
| English sole | <u>Parophrys vetulus</u> | 113 | 1.9 | 1.8 |
| Slender sole | <u>Lyopsetta exilis</u> | 75 | 1.3 | 1.2 |
| Petrale sole | <u>Eopsetta jordani</u> | 54 | 0.9 | 0.9 |
| Sand dab | <u>Citharichthys sordidus</u> | 42 | 0.7 | 0.7 |
| Flathead sole | <u>Hippoglossoides elassodon</u> | 15 | 0.3 | 0.2 |
| Rock sole | <u>Lepidopsetta bilineata</u> | 9 | 0.2 | 0.1 |
| Curlfin sole | <u>Pleuronichthys decurrens</u> | 8 | 0.1 | 0.1 |
| Butter sole | <u>Isopsetta isolepis</u> | 3 | t | t |
| Elasmobranchs: | | | | 34.9 |
| Ratfish | <u>Hydrolagus colliei</u> | 1,838 | 31.4 | 29.2 |
| Dogfish | <u>Squalus acanthius</u> | 298 | 5.1 | 4.7 |
| Skate | <u>Raja sp.</u> | 61 | 1.0 | 1.0 |
| Rockfish: | | | | 9.2 |
| Flag rockfish | <u>Sebastes rubrivinctus</u> | 135 | 2.3 | 2.1 |
| Orange rockfish | <u>Sebastes pinniger</u> | 129 | 2.2 | 2.1 |
| Redstripe rockfish | <u>Sebastes proriger</u> | 77 | 1.3 | 1.2 |
| Blackblotched rockfish | <u>Sebastes crameri</u> | 63 | 1.1 | 1.0 |
| Bocaccio | <u>Sebastes paucispinis</u> | 62 | 1.1 | 1.0 |
| Greenstripe rockfish | <u>Sebastes elongatus</u> | 30 | 0.5 | 0.5 |
| Red snapper | <u>Sebastes ruberrimus</u> | 26 | 0.4 | 0.4 |
| Pacific ocean perch | <u>Sebastes alutus</u> | 26 | 0.4 | 0.4 |
| Yellowtail rockfish | <u>Sebastes flavidus</u> | 26 | 0.4 | 0.4 |
| Silvergray rockfish | <u>Sebastes brevispinis</u> | 4 | 0.1 | 0.1 |
| Pygmy rockfish | <u>Sebastes wilsoni</u> | 2 | t | t |
| Spingcheek rockfish | <u>Sebastes alascanus</u> | 2 | t | t |
| Splitnose rockfish | <u>Sebastes diploproa</u> | 1 | t | t |
| Stripetail rockfish | <u>Sebastes saxicola</u> | 1 | t | t |
| Roundfish: | | | | 8.5 |
| Hake | <u>Merluccius productus</u> | 150 | 2.6 | 2.4 |
| Tomcod | <u>Microgadus proximus</u> | 86 | 1.5 | 1.4 |
| Blackcod | <u>Anoplopoma fimbria</u> | 65 | 1.1 | 1.0 |
| Lingcod | <u>Ophiodon elongatus</u> | 61 | 1.0 | 1.0 |
| Whiting | <u>Theragra chalcogrammus</u> | 60 | 1.0 | 1.0 |
| True cod | <u>Gadus macrocephalus</u> | 58 | 1.0 | 0.9 |
| Eulachon | <u>Thaleichthys pacificus</u> | 42 | 0.7 | 0.7 |
| Herring | <u>Clupea pallasii</u> | 7 | 0.1 | 0.1 |
| Miscellaneous or unidentified species | | 53 | 1.0 | 1.0 |
| Total | | 6,302 | 106.5 | 100.2 |

t - ("trace") equals less than 0.1 percent or less than 0.1 pound per half-hour.

APPENDIX

A detailed fishing log showing the fishing positions, time on bottom, catch particulars, and other pertinent data for each drag is available as an appendix to the reprint of this article. Write for Separate No. 704 which contains "Table 7 - Cruise 56 Fishing Log: Shrimp Explorations off Vancouver Island, British Columbia, October-November 1962."

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SPORT FISHING FOR SHARKS

Sharks are increasing in importance as sport fish. A survey by the U. S. Fish and Wildlife Service estimated that sport fishermen caught 1,715,000 sharks in United States coastal waters in 1960; about 45 percent of those were taken between Maine and North Carolina.

The mako, blue, porbeagle, white, thresher, tiger, and sawfish sharks rank as big-game fish, and are formally recognized among the 50 species of game fish on which the International Game Fish Association keeps worldwide records. Anglers in the Northeast who are interested in trying for record sharks are in an excellent area. Of the current world records for different tackle sizes, 21 were taken in New Jersey, New York, Rhode Island, and Massachusetts.

Anglers agree that few game fish can equal the spectacular leaps and swift runs of the mako. Although other species seldom leap, and opinions on their fighting qualities may be varied, one thing is certain: any large shark, caught on suitable tackle, will test the fisherman's patience and endurance. The excitement of landing a voracious shark has an appealing element of danger that other fishing seldom affords.



All sharks found off the northeastern coast are edible. The mako, porbeagle, thresher, and dogfish are considered most desirable; young fish are preferred to old. The meat can be boiled, fried, broiled, or chowdered, but it should be cooked or cured as soon as possible. Cured, the meat is excellent whether smoked, salted, or kippered.

Fresh mako, hammerhead, small dusky, and dogfish are good eating, particularly when cooked in sauces or with vegetables and other meats. These sharks have a distinctive flavor, milder than some of the more common food fishes. Elaborate preparations are not necessary, but culinary imagination is a helpful ingredient. (Anglers' Guide to Sharks of the Northeastern United States: Maine to Chesapeake Bay, Bureau of Sport Fisheries & Wildlife Circular No. 179, Washington, D. C.)



TRENDS AND DEVELOPMENTS

Alaska

EARTHQUAKE--PRELIMINARY APPRAISAL:

Damage to Fishery Industry: The fishing industry in central Alaska was adversely affected by the earthquake and resulting tidal waves of March 27, 1964. The U. S. Bureau of Commercial Fisheries reported that damage was centered in the Prince William Sound, Cook Inlet, and Kodiak Island areas which have important salmon, crab, and shrimp fisheries.

From the standpoint of damage to fisheries, Kodiak Island was hardest hit. In the Seward area the salmon, shrimp, and king crab fisheries were severely damaged. The salmon and Dungeness crab industries of Prince William Sound were hard hit. The damage to the fishing industry in Cook Inlet appeared to be relatively light.

As of mid-April the total damage to the Alaskan fishing industry could not be estimated. The earthquake raised the land mass 6 to 10 feet in Prince William Sound, making water depths inadequate at many docks, marine ways, and boat anchorages. On the other hand, in the Kodiak Island and Cook Inlet areas the land mass dropped and the sea level has been raised 5 to 8 feet, flooding or threatening dock installations and vessel facilities. It was believed that spring high tides might further damage fishery facilities.

Preliminary reports indicated little damage on the Alaska Peninsula, Aleutian Islands, and Bristol Bay. Equipment in Southeastern Alaska below Yakutat was virtually unaffected. Since the earthquake occurred during the off-season for most fisheries, operators had a little time for assessment and planning. It was believed there would not be too much difficulty in getting salmon canning into operation in the major areas by mid-June. But probably more difficulty would be experienced in resuming king crab industry operations on a normal scale. The production of canned salmon in Alaska this year should not be se-

riously affected. The halibut fleet was not affected by the earthquake.

It is too early to predict the long-range effect on the actual fishery resources of Alaska. The Federal and State Governments are marshalling their forces to help rebuild Alaska's fishing and other industries affected by the earthquake.

The Alaska Department of Fish and Game announced on April 2 that the deadline for the licensing of salmon fishing nets and vessels in the Kodiak, Prince William Sound, and Cook Inlet registration areas was extended by emergency regulation to May 15, 1964. This was done to give all fishermen and the industry a month in which to assess damage and losses which occurred to vessels and gear in those areas so they may license accordingly.

* * * * *

Salmon Harvest Not Jeopardized: Alaska fishing vessel and gear losses in the Cook Inlet, Kodiak, and Prince William Sound areas have not jeopardized the ability of the fishermen of the State to harvest the salmon runs during the 1964 season, according to the Alaska Commission of Fish and Game.

The effects of the earthquake and resultant tidal wave on the fishing fleet have been assessed by preliminary surveys. Information received by the Alaska Fish and Game Department indicates that the available Alaskan fishing gear will be able to harvest in an orderly manner the pink, red, and other salmon runs of Kodiak, Prince William Sound, Copper River, and Cook Inlet.

Nonresidents were being advised that the local gear is fully capable of taking the runs. Any significant increase of nonresident salmon gear would compound management problems and would result in greatly reduced fishing time for everyone. It would not be in the

best interest of the resource or the commercial fishermen to have an influx of gear from outside of Alaska during the coming season, the Alaska Commissioner of Fish and Game stated. (Alaska Department of Fish and Game, April 13, 1964.)

* * * * *

FOREIGN FISHING ACTIVITY OFF ALASKA, LATE MARCH 1964:

By the end of March 1964, the Soviet fishing fleet believed to be trawling for Pacific Ocean perch in the Gulf of Alaska southwest of Yakutat had increased to about 30 vessels.

Another Soviet fleet began fishing in the vicinity of Chirikof Island with indications that it also was trawling for Pacific ocean perch. This second fleet was estimated to consist of about 18 trawlers, 1 factoryship, and at least 2 reefers and support vessels.

The Soviet fleet in the northeastern Bering Sea was believed to consist of at least 125 trawlers, 15 reefers, about 4 factoryships, and about 3 cargo vessels. Major fishing emphasis was believed to have shifted from herring to Pacific ocean perch and, to a lesser degree, flounder and sole.

Two Japanese king crab factoryships, each accompanied by 6 catcher vessels, were reported to have left Japan on March 1 for the Bristol Bay king crab fishery. This year they are beginning the season two weeks earlier than last year. Their combined catch quota of 235,000 cases of canned king crab is the same as in 1963.

The Japanese shrimp factoryship Chichibu Maru, accompanied by 12 trawlers, was reported in March to be fishing for shrimp in the area northward of Unimak Pass in the Bering Sea. Although fishing operations were to be primarily for shrimp, Pacific ocean perch and herring are included as part of the production goal of the fleet.

* * * * *

SIX NEW VESSELS BEING BUILT FOR ALASKAN FISHERMEN:

Six new fishing vessels of modern design are being built at shipyards in the State of Washington for delivery to Alaskan fishermen. Three of those vessels are being financed with replacement loans and 3 are being built under the Mortgage Insurance Program

of the U. S. Bureau of Commercial Fisheries.

* * * * *

CANNED FISHERY PRODUCTS PACK, 1963:

The total wholesale value of the Alaska canned pack of crab, shrimp, clams, and salmon in 1963 was \$75.9 million as compared with the Alaska canned pack value of about \$100.9 million in 1962, according to preliminary data from the Alaska Department of Fish and Game.

The canned salmon pack in 1963 was 2,652,922 cases (48 1-lb. cans), down 858,190 cases from the 3,511,112 cases packed in 1962.

The king crab pack in 1963 amounted to 255,881 cases (48 7½-oz. cans) as compared with 187,112 cases in 1962, 152,719 cases in 1961, and 100,105 cases in 1960. The Dungeness crab pack in 1963 amounted to 15,650 cases (48 6½-oz. cans) as compared with 16,322 cases in 1962.

The shrimp pack in 1963 amounted to 61,950 cases (48 5-oz. cans) as compared to 86,184 cases in 1962.

The clam pack in 1963 amounted to 5,960 cases (48 4⅔-oz. cans) as compared to 10,200 cases in 1962.

Note: See Commercial Fisheries Review, July 1963 p. 28.



Alaska Fishery Investigations

TAGGED KING CRAB RETAINS TAG OVER SIX YEARS:

Intensified king crab fishing in the Kodiak Island area yielded a return of 178 tags during March 1964. This was the largest monthly return of tags since November 1962. Most of the returns were from inshore locations. On January 28, 1964, a tagged crab was caught near the Shumagin Islands, which had been released within 10 miles of the area six and one-half years earlier. This is the longest period between release and recapture recorded to date. During that time the crab grew from 4.1 to 7.6 inches in carapace width. The tag probably remained on the crab through 5 or 6 molts.

* * * * *

SOUTHEAST PINK EGG SURVIVAL RATE CONSIDERED GOOD:

The winter survival of salmon eggs was measured during March by egg-pump sampling at Little Port Walter, Traitors Cove, and Olsen Bay. Survival rates of pink salmon eggs and fry in Little Port Walter and Traitors Cove streams were good. Above the medium high-tide level survival ranged from 9 to 43 percent. Only 0.5-percent survival was noted for Traitors Cove chum salmon which had been subjected to severe post-spawning low flows. Olsen Bay sampling in Prince William Sound showed a fair survival of preemergent pink fry and a good survival of chum fry. The effects of the severe earthquake on preemergent fry survival was unknown. Sampling was being done in March by the Alaska Department of Fish and Game to obtain postquake fry abundance in Prince William Sound. The Bureau's Auke Bay Laboratory biologists were to sample Olsen Bay again since it was near the center of the disturbance. This may give some indication as to the effects of the earthquake.

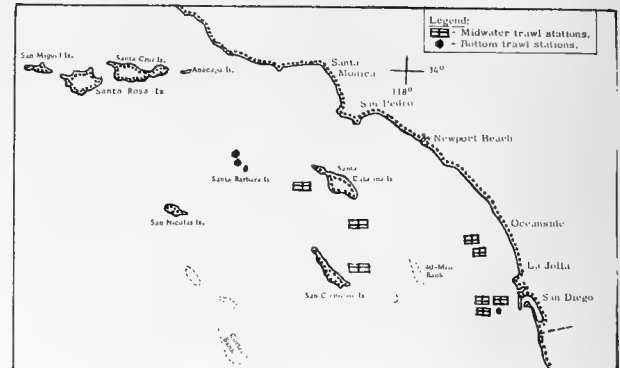


California

BOTTOM-TRAWLING EXPLORATIONS OFF SOUTHERN CALIFORNIA:

M/V "N. B. Scofield" Cruise 64-S-1 (February 25-March 11, 1964): The objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield were to: (1) conduct ecological surveys of representative areas and to evaluate methods and goals for possible future work; (2) continue exploration of offshore areas for bottom-trawling grounds; and (3) collect a sample of kelp bass (Paralabrax clathratus) for reproduction studies. The area of operations was in the southern California coastal waters from northern Channel Islands to the California-Mexican boundary.

Because of continual gales it was not possible to occupy trawling stations during more than half of the cruise period. Eight mid-water trawling stations and 3 bottom-trawling stations were occupied. All tows were for 30 minutes, although the total time from beginning to completion of a deep mid-depth haul is at least $2\frac{1}{2}$ hours. Where possible, all fish and invertebrates were identified and enumerated and common fish species were measured. Unidentified and unusual



Shows station pattern of M/V N. B. Scofield Cruise 64-S-1, February 25-March 11, 1964.

marine specimens were saved for specialists. A number of rare cephalopods were obtained for a special study sponsored by California's Department of Fish and Game. A large-pelagic octopus of the genus Alloposus was caught off San Diego, and may be a first for California waters. Other bathypelagic fish species including lanternfish, lightfish, and an anglerfish were collected on this cruise.

Santa Barbara Island Area: Bottom trawls were made in depths of 220-245 fathoms. Fair numbers of Dover sole (Microstomus pacificus), a few sablefish (Anoplopoma fimbria), and ratfish (Hydrolagus coliei) as well as 10 longnose skates (Raja rhina) were caught along with a few other flatfish and a fair number of rockfish. This area appears to be generally trawlable on the basis of two exploratory cruises. A number of unusual cephalopods, and large catches of bathypelagic fishes were made. Work had to be terminated in this area as weather and sea conditions worsened and could not be resumed until conditions improved seven days later off San Diego.

San Diego Area: Bottom trawl work was discontinued near the end of the cruise when the net was torn up west of Pt. Loma. Several midwater hauls were made off San Diego and La Jolla which yielded a number of interesting bathypelagic fish and invertebrates. A night haul was made west of Pt. Loma with 200 fathoms of cable out which produced results comparable to those obtained with 700 fathoms in daytime hauls.

Santa Catalina and San Clemente Islands Area: Good collections of deep-water fish and invertebrates were made off Santa Catalina Island and between there and San Clem-

ente Island. Good kelp bass fishing at Santa Catalina Island yielded a sample of kelp bass needed by the Department's Sportfish Project for studies in reproduction.

Kelp bass fishing at San Clemente Island was poor

Note: See Commercial Fisheries Review, February 1963 p. 20.

* * * * *

PELAGIC FISH POPULATION SURVEY CONTINUED:

Aerial surveys to determine the distribution and abundance of pelagic fish schools were continued during flights over the inshore area off the California coast by aircraft of the California Department of Fish and Game. The following airplane spotting flights were made from February 10 to April 3, 1964:

Airplane Spotting Flight 64-3 (February 10-11, 1964): Cessna "182" 9042T scouted the inshore area from Point Ano Nuevo to the United States-Mexican Border during the survey flight.

Weather conditions were quite variable on both days of this survey. From Point Sur north, visibility was hindered by low clouds and rain squalls. South of Point Sur, conditions improved and were generally good for the balance of the survey.

On February 10 the area from Point Ano Nuevo to Point Vicente was scouted. One Pacific sardine (Sardinops caeruleus) and two northern anchovy (Engraulis mordax) schools were seen between Point Sur and Piedras Blancas.

On February 11, the area from Point Vicente to the United States-Mexican Border was scouted. Only six small anchovy schools were seen that day, all in the general area of Los Angeles-Long Beach harbor.

Airplane Spotting Flight 64-5 (February 19-21, 1964): Beechcraft N5614D surveyed the inshore and offshore waters from Long Beach, Calif., to Point Eugenia, Baja California, during this flight.

On the first day's flight the area from Long Beach to Point Eugenia-Cedros Island was scouted. Air and water visibility were exceptionally good but at Cedros Island a high cloud cover and strong ground winds caused poor water visibility. Those conditions persisted during the return flight along

the eastern shore area of Sebastian Viscaïno Bay, north to Point San Antonio. From that Point north to Long Beach, aerial spotting conditions were excellent.

Concentrations of northern anchovies (Engraulis mordax) were found in the Dana Point, Oceanside, and Carlsbad areas where none had been seen on the previous week's flight. South of the United States-Mexican Border a large concentration of mixed anchovy and Pacific sardine (Sardinops caeruleus) schools were encountered at Cape Colnett. The largest concentration of sardines (41 schools) was between Point Eugenia and Scammons Lagoon.

Gray whales (Eschrichtius glaucus) were common along most sections of the coastline. At Scammons Lagoon over 30 whales were counted just inside the mouth. That lagoon is one of their major breeding areas.

On February 21 the southern California Channel Islands area was scouted. Strong desert winds off southern California precluded flights the day previous. The 21st was clear except for the Santa Catalina Island area where a low haze limited visibility to between 5 and 8 miles. Despite poor visibility around the island, 83 anchovy schools and several schools of Pacific bonito (Sarda chiliensis), jack mackerel (Trachurus symmetricus), and other unidentified pelagic fish were seen. Over 100 Pacific pilot whales (Globiocephala scammoni) comprising 15 schools were sighted along the western side of the island.

On this flight four small sardine schools were found near Santa Barbara Island. Seven gray whales and one unidentified mammal were seen near Santa Rosa and Santa Cruz Islands; 16 individual gray whale and two pilot whale schools were spotted in the vicinity of San Clemente Island.

Airplane Spotting Flight 64-6 (March 9-11, 1964): Cessna "182" 9042T surveyed the inshore area from Moss Landing, Monterey Bay, to the United States-Mexican Border on this flight.

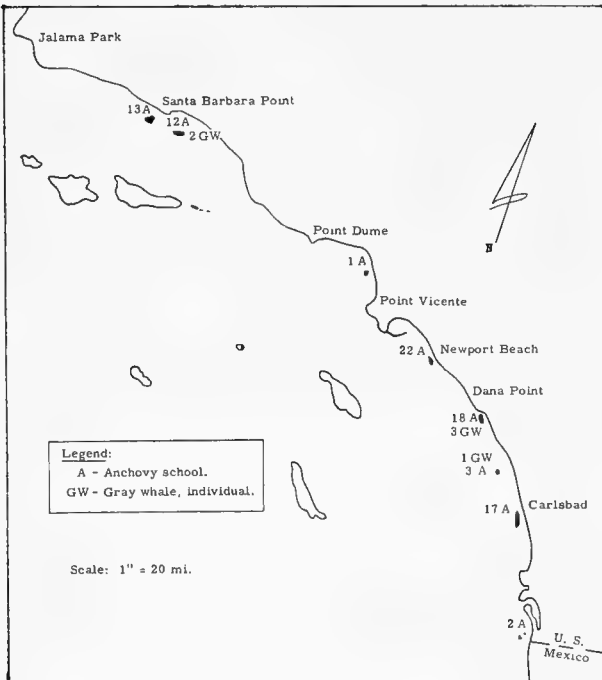
On the first day's flight the area from Moss Landing to Point Vicente was scouted. Weather conditions were fair to poor. Rain squalls were encountered north of Moss Landing and broken, scattered clouds south to Mussel Point. A smoky haze severely limited aerial visibility from Santa Barbara to Point Vicente.

A total of 8 northern anchovy (*Engraulis mordax*) schools were sighted between Santa Barbara and Point Vicente and 29 gray whales (*Eschrichtius glaucus*) were seen between Santa Barbara Point and Monterey Bay.

The area between the Mexican Border to Point Vicente was scouted on the second day's flight. Air and water visibility were generally good with the exception of the San Diego area where rain squalls were encountered. The largest anchovy school group encountered this year (247 schools) was sighted between Laguna Beach and Point Vicente.

The area from Point Vicente to Piedras Blancas was scouted on the last day of this survey. Thick smoke and haze persisted south of Jalama Park. Low broken clouds were encountered until reaching Estero Point and thereafter rain squalls prevailed. Despite very limited visibility, anchovy school groups were located off Port Hueneme and in Santa Monica Bay.

Airplane Spotting Flight 64-7 (April 1-3, 1964): Cessna "182" 9042T surveyed the in-shore area from Pigeon Point, San Mateo County to the United States-Mexican Border during this survey flight. No scouting was done on April 1, the first day of the survey, because of poor weather.



Pelagic Fish Survey Flight 64-7, April 1-3, 1964.

The area from Pigeon Point to Point Vicente was scouted on April 2. High winds caused rough seas throughout the area flown and no fish schools were seen.

On the last day of the flight the area from the United States-Mexican Border to Jalama Park was surveyed. Water and air visibility were generally good. Northern anchovy (*Engraulis mordax*) school groups were seen at Newport Beach, Dana Point and Carlsbad in the morning. One other group of anchovies was sighted at Santa Barbara Point. The large anchovy school group sighted near Newport Beach in March had diminished to only a few scattered schools.

Note: See Commercial Fisheries Review, February 1963 p. 20; April 1964 p. 12.

* * * * *

HEARINGS ON EXPERIMENTAL ANCHOVY INDUSTRIAL FISHERY:

The California State Fish and Game Commission held a special meeting in Monterey, Calif., May 11, 1964, to hear public comments on a proposed experiment to allow commercial fishermen to take a maximum of 13,000 tons of anchovies for reduction purposes, during the 12-month period beginning April 1, 1964, and ending March 31, 1965. (California Department of Fish and Game, April 6, 1964.)

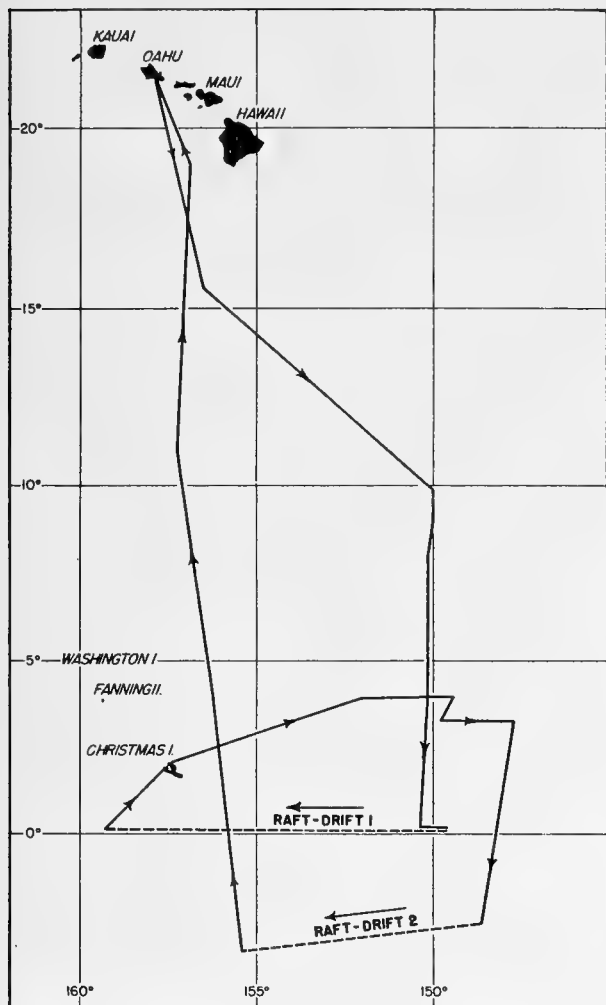


Central Pacific Fisheries Investigations

PELAGIC FISH POPULATION STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 71-- PART I (February 3-6, 1964): To selectively fish for small skipjack for visual acuity studies and small yellowfin for sound perception studies was the principal purpose of Part I of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert. During 3 days of fishing in an area 3 to 5 miles off Makapu, Oahu, a total of 86 skipjack tuna, 82 yellowfin tuna, and 26 frigate mackerel were caught and brought back alive to shore tanks. The captured fish ranged in size from 1½ to 2 pounds.

PART II (February 14-March 27, 1964): To make observations on the ecology and behavior of the marine community in the area of a drifting raft and to collect specimens in the raft community were the main objectives of Part II of this cruise by the Charles H. Gilbert.



M/V Charles H. Gilbert Cruise 71--Part II, February 14--March 27, 1964.

On February 22, 1964, a raft was launched in an area of upwelling close to the Equator at latitude $00^{\circ}09' N.$, longitude $149^{\circ}35' W.$ to begin drift #1. Over a period of 193 hours 31 minutes it drifted due west for 576 nautical miles at an average rate of 2.5 knots until recovered March 1, 1964, at latitude $00^{\circ}10' N.$, longitude $159^{\circ}12' W.$ It was decided not to duplicate drift #1 as specified on the cruise plan, but to start drift #2 at latitude $4^{\circ} N.$ near the boundaries of the South Equatorial and Equatorial Counter Currents, an area where tuna had been sighted earlier. Poor visibility and rough seas prevented launching in that area, so drift #2 was started south of the Cromwell Current at latitude $02^{\circ}33' S.$, longitude $148^{\circ}143' W.$ During drift #2 the raft over a period of 215 hours 30 minutes drifted for 395 miles at an average rate of

1.8 knots. Drift #2 was terminated March 20, 1964, at latitude $03^{\circ}26' S.$, longitude $155^{\circ}18' W.$

Fish species observed during the drifts were: skipjack (*Euthynnus pelamis*)--adults and juveniles; yellowfin (*Neothunnus macropterus*)--small adults and juveniles; wahoo (*Acanthocybium solandri*); common dolphin (*Coryphaena hippurus*)--adults; little dolphin (*C. equiselis*)--adults and juveniles; mackerel scad (*Decapterus pinnulatus*); rainbow runner (*Elegatis bipinnulatus*); pilotfish (*Naucrates ductor*); rudderfish (*Psenes cyanophrys*); man-of-war fish (*Nomeus gronovii*); shark-sucker (*Remora remora*); puffer (*Arothron* sp.); flying-fish (*Exocoetidae*); blue shark (*Prionace glauca*); whitetip shark (*Pterolamiops longimanus*); whale shark (*Rhincodon typus*); and manta ray (*Manta* sp.). In addition, single specimens of an unidentified shark, free swimming remora, juvenile carangid, turtle, and porpoise were seen.

A greater variety and larger number of most species were observed around the raft during drift #2 than during drift #1. No fish accumulated around the raft in commercial quantities. A large percentage of the rudderfish and pilotfish which collected at the raft were caught with the raft purse net at the end of each drift. The only other fish captured at the raft was a single mackerel scad. Attempts to capture dolphin, wahoo, and other mackerel scad were unsuccessful.

Nineteen hundred feet of 16 millimeter color and black-and-white movie film and 548 color and black-and-white still pictures were taken of the marine life sighted from the raft and of general operations. Detailed field notes were kept during the 90 hours and 31 minutes of observation during drift #1 and 100 hours and 30 minutes of observation during drift #2. Attempts to track individual fish with sonar were unsuccessful, but the presence of fish beneath the raft out of visual range was monitored with the sonar during drift #2 for 15 minutes out of every hour during daylight hours.

Other experimental work during the cruise included efforts to sample tuna schools by live-bait and long-line fishing; to tag tuna when possible; and to collect larval and juvenile forms of tuna and tunalike fish with night-light fishing and plankton tows.

Five long-line stations were occupied with 5-basket 6-hook gear while the raft was drifting. During drift #1, the Cromwell Current set the long-line gear to the east while the raft drifted west, making it necessary to take the gear in early in order to keep the raft in sight. While long lining during drift #2, the research vessel was tied to the gear for part of the time to increase the duration of the set. A total of six whitetip sharks were caught but none was tagged. Six additional whitetip sharks were caught by hand-line and tagged. Two common dolphin were caught with squid hooks from the vessel. No other fish were caught from the vessel in the drift area. Two skipjack tuna, 2 wahoo, and 1 dolphin were caught by trolling.

Sixteen 1-hour night-light fishing stations were completed from the vessel while the raft was drifting. No tunalike fish were captured or seen. Several species of dolphin (*Coryphaena*) were collected. A total of 53 plankton tows was made.

Bathymograph casts were made and surface salinity readings were taken at 3-hour intervals on all cruise tracks and at 6-hour intervals when drifting. In an effort to determine variability in an area where internal waves may be important, hourly bathymograph casts, salinity samples, and surface temperatures were taken during a 24-hour period which began on February 24 at latitude 00°09' N., longitude 152°27' W. and terminated on February 25 at latitude 00°10' N., longitude 153°38' W.

The thermograph was operated continuously while at sea.

Drift cards were released with each bathymograph cast north of latitude 12° N. on the outbound and inbound tracks and when each drift began and ended. A total of 920 drift cards was released.

A secchi and forel color reading were made at noon each day while drifting.

Flyingfish which landed on deck were collected for stomach analysis.

A standard watch for fish, birds, and aquatic mammals was made during daylight hours while under way and when the raft was drifting. A total of 4 skipjack schools and 11 unidentified schools were sighted. Of those, only one school was seen while drift-

ing and it was unidentified. No schools were fished.

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TUNA STUDIES CONTINUED:

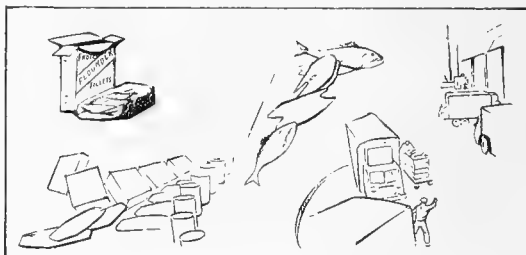
M/V "Charles H. Gilbert" Cruise 70 (January 3-22, 1964): To capture live tuna in waters off Hawaii was the objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert. A total of 23 skipjack tuna and 38 kawakawa (little tuna) were caught and placed in shore ponds.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-MARCH 1964:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, more fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers in March 1964 than in the previous month. The increase was 3.6 percent in quantity, although the value was about the same in both months. Compared with the same month in the previous year, purchases in March 1964 were up 15.4 percent in quantity and 4.9 percent in value.



Total purchases in the first 3 months of 1964 were up 11.0 percent in quantity but down 6.3 percent in value from those in the same period of the previous year. In 1964, there were larger purchases of flounder fillets, scallops, oysters, and clams, but smaller purchases of cod fillets, haddock fillets, and halibut steaks.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, March 1964 with Comparisons

| QUANTITY | | | | VALUE | | | |
|--------------------------|-------|------------|-------|-----------------------|-------|------------|-------|
| March | | Jan. -Mar. | | March | | Jan. -Mar. | |
| 1964 | 1963 | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 |
| (1,000 Lbs.) | | | | (\$1,000) | | | |
| 2,382 | 2,064 | 6,790 | 6,117 | 1,236 | 1,178 | 3,555 | 3,792 |

Table 2 - Selected Purchases of Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, March 1964 with Comparisons

| Product | March | | Jan. -Mar. | |
|----------------------|---------|---------|------------|-----------|
| | 1964 | 1963 | 1964 | 1963 |
| (Pounds) | | | | |
| Shrimp: | | | | |
| Raw headless | 99,150 | 1/ | 282,050 | 1/ |
| Peeled and deveined | 46,472 | 1/ | 231,222 | 1/ |
| Breaded | 456,200 | 1/ | 1,094,200 | 1/ |
| Total shrimp | 601,822 | 494,290 | 1,607,472 | 1,626,633 |
| Scallops | 299,900 | 171,168 | 691,000 | 570,968 |
| Oysters: | | | | |
| Eastern | 121,530 | 1/ | 326,918 | 1/ |
| Pacific | 21,676 | 1/ | 73,806 | 1/ |
| Total oysters | 143,206 | 156,075 | 400,724 | 349,522 |
| Clams | 43,850 | 8,744 | 120,358 | 79,700 |
| Fillets: | | | | |
| Cod | 22,700 | 58,360 | 127,246 | 175,598 |
| Flounder and sole | 316,000 | 307,800 | 1,173,816 | 987,852 |
| Haddock | 217,650 | 189,300 | 2/577,894 | 684,220 |
| Ocean perch | 348,520 | 422,258 | 1,011,120 | 970,590 |
| Steaks: | | | | |
| Halibut | 112,500 | 152,308 | 307,025 | 402,428 |
| Salmon | 25,735 | 17,405 | 49,302 | 51,535 |
| Swordfish | 2,610 | 6,130 | 5,310 | 9,180 |

1/Breakdown not available.
2/Includes 8,650 pounds of haddock portions.

Canned: In the first 3 months of 1964, total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) were much higher than in the same period of the previous year. The increase was due to larger purchases of tuna and salmon. The gain was partly offset by smaller purchases of canned sardines.

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, March 1964 with Comparisons

| Product | QUANTITY | | | | VALUE | | | |
|---------|--------------------------|------|------------|------|-----------------------|------|------------|------|
| | March | | Jan. -Mar. | | March | | Jan. -Mar. | |
| | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 |
| | (1,000 Lbs.) | | | | (\$1,000) | | | |
| Tuna | 529 | 686 | 1,457 | 696 | 236 | 352 | 644 | 358 |
| Salmon | 1/ | - | 679 | 6 | 2/ | - | 416 | 4 |
| Sardine | 19 | 49 | 79 | 143 | 8 | 22 | 30 | 61 |

1/Less than 500 pounds.
2/Less than \$500.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because data on local purchases are not obtainable.

(2) See Commercial Fisheries Review, May 1964 p. 16.



Fur Seals

PRICES FOR ALASKA SKINS AT SPRING 1964 AUCTION:

The spring auction in 1964 (April 16-17) of United States Government-owned fur seal

skins yielded \$2.28 million. The average price per skin received for male fur seal skins (dyed Black, Kitovi, and Matara) was \$105.45 and for female skins (dyed Black, Kitovi, and Matara) the average price was \$71.16. At the fall 1963 auction, male and female skins were offered in mixed lots and the overall average price for the three colors of skins was \$111.72. Of a total of 10,311 Black skins sold at the October 1963 auction, 10,137 were male and the average price for those, including the small number of female skins, was \$126.13. At the spring 1963 auction, the three colors of male skins brought a record high average price of \$122.52.

The average price received for both male and female fur seal skins (dyed Black, Kitovi, and Matara) at the April 1964 auction was \$90.60. Lakoda, or female sheared seal skins, brought an average price of \$48.82, or much higher than the average of \$40.63 received at the fall 1963 auction, and more than the average of \$43.09 received at the spring 1963 auction.

Average prices per skin received for processed male fur seal skins at the spring 1964 auction were: Black, \$107.65; Kitovi, \$88.42; Matara, \$108.77. Average prices for both male and female dyed skins at the spring 1964 auction were (average for fall 1963 auction in parentheses): Black, \$92.47 (\$126.13); Kitovi, \$81.66 (\$95.58); Matara \$91.58 (\$103.94).

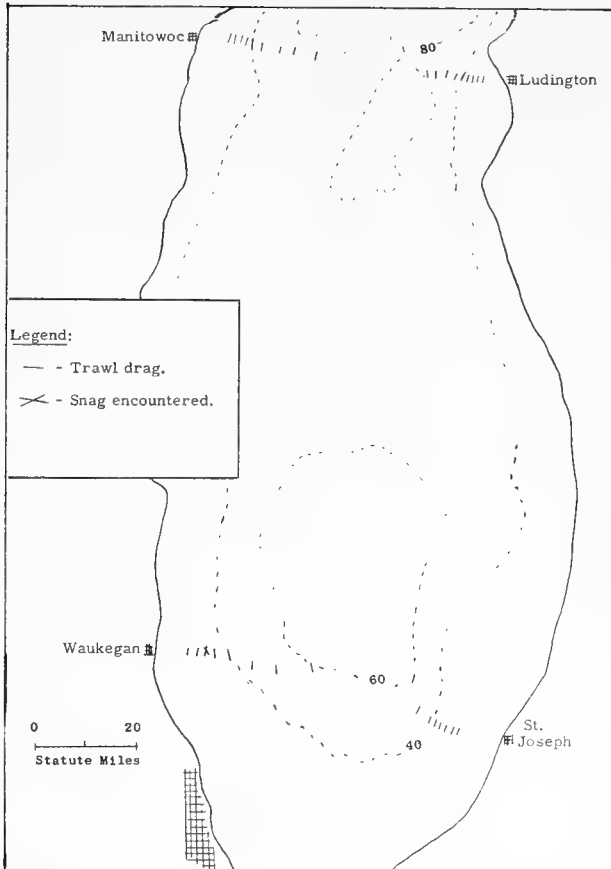
Note: See Commercial Fisheries Review, December 1963 p. 25 and June 1963 p. 24.



Great Lakes Fisheries Exploration and Gear Research

SEASONAL DISTRIBUTION AND ABUNDANCE OF ALEWIFE AND CHUB STOCKS IN LAKE MICHIGAN STUDIED:

M/V "Kaho" Cruise 16 (March 31-April 9, 1964): To extend knowledge of the seasonal distribution and abundance of alewife and chubs and their availability to bottom trawls was the primary objective of this cruise in central and southern Lake Michigan by the U. S. Bureau of Commercial Fisheries exploratory fishing and gear research vessel Kaho. Particular attention was given to determining the differentials in east-west and north-south distribution and commercial potential of those fish stocks. Other activities of the cruise



Lake Michigan explorations M/V Kaho Cruise 16 (March 31-April 9, 1964).

were concerned with collecting length-frequency data on alewife and chubs to supplement material collected earlier, and collecting samples of fish, water, and bottom materials for laboratory analysis relating to special studies.

FISHING OPERATIONS: A total of 34 trawl drags were completed with a 52-foot (headrope) fish trawl in 6 days of operation-- 8 drags were made from 20 to 60 fathoms off St. Joseph, Mich., and 8 from 20 to 60 fathoms off Waukegan, Ill.; 9 drags were made from 20 to 70 fathoms off Manitowoc, Wis., and 9 from 20 to 70 fathoms off Ludington, Mich. All drags were of 30 minutes duration and were made in one direction only. Minor gear damage occurred during one drag at 30 fathoms off Waukegan. Bottom topography and vertical distribution patterns of fish were continuously recorded with a high-resolution depth-recorder.

FISHING RESULTS: The investigations, completed along the lakewide transects be-

tween St. Joseph and Waukegan, and between Manitowoc and Ludington revealed significant differences in depth distribution, abundance, and species interrelationship from both south and central Lake Michigan and from one side of the lake to the other. The most noteworthy feature observed was the almost total absence of alewife from trawl catches off Manitowoc.

Alewife dominated the catches from 25 to 35 fathoms off St. Joseph, and also from 45 to 50 fathoms off Waukegan, and at 40 fathoms off Ludington. The best alewife catch was 945 pounds made in a 30-minute drag at 50 fathoms off Waukegan.

Good catches of chubs (310 to 405 pounds per 30-minute drag) were made in 40 and 45 fathoms off St. Joseph, in 35 and 40 fathoms off Waukegan, and in 35 fathoms off Ludington.

Echo-sounder operations revealed good to excellent concentrations of alewife and chubs in midwater depths at 35 to 50 fathoms off Ludington.

Only limited catches of species other than chub or alewife were taken during the cruise.

Other Species Taken in Lake Michigan by M/V Kaho

| Species | No. of Drags Yielding | Pounds/Drag | Combined Catch (Pounds) |
|-------------|-----------------------|-------------|-------------------------|
| Herring | 3 | 6-47 | 60 |
| Sculpin | 19 | 6-160 | 647 |
| Smelt | 5 | 2-105 | 124 |
| Sucker | 1 | 1 | 1 |
| Trout-perch | 2 | 4-17 | 21 |
| Whitefish | 1 | 3 | 3 |
| Sea lamprey | 1 | 1 | 1 |

HYDROGRAPHIC DATA: Bathythermograph casts were made at key stations, and air and surface water temperatures were recorded continuously. Surface water temperatures ranged from 34° to 35° F. during the cruise.

Note: See Commercial Fisheries Review, May 1964 p. 18.

Hawaii

FISHERIES LANDINGS, 1962-1963:

Commercial landings of fish and shellfish in the State of Hawaii in 1963 were down 10.7 percent in quantity and 4.9 percent in value from those in the previous year, due mainly to a drop in landings of skipjack tuna and big-eyed tuna.

| Hawaiian Commercial Fisheries Landings and Ex-Vessel Value, 1962-1963 | | | | |
|--|---------------------------|------------------|---------------------------|------------------|
| Species | 1963 | | 1962 | |
| | Quantity 1,000 Lbs. | Value \$1,000 | Quantity 1,000 Lbs. | Value \$1,000 |
| Tuna and Tunalike Fish: | | | | |
| Albacore | 15.0 | 4.7 | 16.7 | 4.0 |
| Big-Eye | 948.3 | 501.7 | 1,220.8 | 598.1 |
| Yellowfin | 384.9 | 153.2 | 396.8 | 143.0 |
| Skipjack | 8,099.3 | 1,089.8 | 9,415.4 | 1,174.0 |
| Bonito or little tuna | 60.2 | 8.3 | 13.3 | 2.4 |
| Total tuna and tunalike fish | 9,507.7 | 1,757.7 | 11,063.0 | 1,921.5 |
| Other fish and shellfish . . . | 2,248.9 | 924.3 | 2,106.7 | 897.8 |
| Total fish and shellfish . . . | 11,756.6 | 2,682.0 | 13,169.7 | 2,819.3 |

The Island of Oahu was the State's leading fishery center in 1963 with a catch of 8,630,351 pounds. The Island of Hawaii was in second place with a catch of 1,651,787 pounds, followed by the Island of Maui with a catch of 1,222,536 pounds. The remainder of the catch was landed at ports on the Islands of Kauai, Lanai, and Molokai. (Hawaiian Department of Land and Natural Resources, March 30, 1964.)

Note: See Commercial Fisheries Review, June 1963 p. 33.



Industrial Fishery Products

OBSERVATIONS ON FISH MEAL USE IN ANIMAL FEED:

Some research results that showed that fish meal added to all-vegetable laying rations resulted in small body weight increases, increased egg production, and improved efficiency were presented by the head of the Department of Poultry Science, Texas A. and M. University. The results were presented at the National Fisheries Institute (NFI) Symposium and the Maryland Nutrition Conference held at Washington, D. C., on March 11, 1964, and March 12-13, respectively. Least cost for feed per unit of production was achieved with 5-percent fish meal in the ration. The results of the research suggest that both amino acids and unidentified growth factors contributed to the improved performance with fish meal. The results also demonstrated that not all fish meals of like nitrogen content are of equal value in egg production.

At the Maryland Nutrition Conference, a researcher from the Poultry Science Department, University of Maryland, gave some results of experiments in which solvent-extracted fish meal was used at relatively high levels in broiler rations. The objective of the experiments was to determine the feasibility of using solvent-extracted (low fat)

fish meals instead of regular fish meals when price structures of feed ingredients are such as to result in maximum profit when fish meal is used at levels as high as 15 percent of the ration. The objective of substituting solvent-extracted fish meal for regular fish meal under such conditions is to avoid the relatively high levels of fish oil in the rations that may accompany the use of regular fish meal at high concentrations. The trials demonstrated that solvent-extracted fish meal even at levels as high as 15 percent of the ration (highest level tested) yields results equal to those with regular fish meal and, consequently, that solvent-extracted fish meal can be substituted for regular fish meal in poultry rations whenever, in the judgment of the ration formulator, it is advisable to do so.

Two nutritionists of the U. S. Bureau of Commercial Fisheries Technical Advisory Unit visited feed mills in North Carolina, Tennessee, and Virginia, and scientists at the Universities of North Carolina and Tennessee the latter part of March. Their observations were:

The mean levels of fish-meal utilization in the area visited appear to be: (1) in broiler starter rations 5 percent; (2) in broiler finisher rations 3.5 percent; (3) in breeder rations 2.5 percent; and (4) in laying rations 0.5 percent. Those are fairly liberal fish-meal allowances and that may be attributed in part to the fact that most of the mixed feed producers visited by the Bureau's nutritionists are able to obtain fish meal in bulk truck shipments directly from the fish-meal plants.

One feed producer in North Carolina stated that he is marketing a pullet ration containing only 10 percent protein, a level 2 percent lower than the minimum recommended by nutritional authorities at his State Experiment Station and equal to only five-eighths of that recommended by the National Research Council. The net effect of the low-protein ration is to delay egg production by about 3 weeks and to lower feed costs somewhat during the pullet year. The use of less than the recommended levels of protein conceivably could have unfortunate long-term effects.

Trials completed recently at the University of Tennessee suggest that cattle can utilize menhaden oil at a level equal to 2 to 3.5 percent of the ration if an all-grain ration is fed, or in amounts equal to the oil that would be consumed under such conditions if some or all of the feed is given as roughage. The re-

sults of those trials will be published if plans made at that time are carried out. The importance of those results rests upon the fact that fat at a level equal to 2 percent of the feed consumed is often sprayed upon the roughage fed cattle in fattening operations. Stabilized vegetable and animal fats are presently used, but it appears that fish oil could be used more conveniently than fats that must be heated before spraying on the feed. However, at prevailing prices, fish oil was considered too valuable for that use.

Poultry trials have been carried out at the University of Tennessee in which growing chicks responded equally well to 1-, 2-, or 5-percent fish meal in rations that were 25 percent protein. At a protein level as high as that, it is doubtful that "extra" methionine and lysine of fish meal were influential in promoting growth. Therefore it is logical to conclude that the growth-promoting effect observed was due to UGF (unidentified growth factors) in the meal used in the trials and that the level of UGF was high enough to meet requirements even when fish meal was fed at the 1-percent level.

Findings of the Bureau's nutritionists based on their observations demonstrate that a number of problems exist in the industrial fish products market. Examples of those problems are:

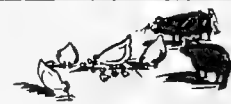
1. A number of mixed feed producers pointed out that if the price of fish meal continues to advance, the product may be "priced off the market."
2. Some feed mill operators expressed dissatisfaction with the fact that they are able to obtain domestically-produced fish meal throughout the year.
3. Some feed men pointed out that the quality of imported fish meal is extremely variable and that most such meal has been very "dusty" (low oil content) during the past year.
4. Many producers use less fish meal in mixed feeds than research findings have shown to be optimum.

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U. S. FISH MEAL, OIL, AND SOLUBLES:
Production by Areas, March 1964: Preliminary data on U. S. production of fish meal,

oil, and solubles for March 1964 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

| U. S. Production ^{1/} of Fish Meal, Oil, and Solubles by Areas, March 1964 (Preliminary) with Comparisons | | | | |
|--|-----------------------|------------------------|----------|---|
| Area | Meal Short Tons | Oil 1,000 Pounds | Solubles | Homogenized ^{2/} .. (Short Tons) .. |
| March 1964: | | | | |
| East & Gulf Coasts | 762 | 66 | 186 | - |
| West Coast ^{2/} | 2,240 | 270 | 1,111 | - |
| Total | 3,002 | 336 | 1,297 | - |
| Jan.-Mar. 1964 | | | | |
| Total | 6,946 | 3,025 | 3,245 | - |
| Jan.-Mar. 1963 | | | | |
| Total | 7,800 | 1,168 | 4,179 | 300 |
| ^{1/} Does not include crab meal, shrimp meal, and liver oils. | | | | |
| ^{2/} Includes American Samoa and Puerto Rico. | | | | |
| ^{3/} Includes condensed fish. | | | | |



Maine Sardines

CANNING SEASON OPENS:

The 94th consecutive Maine sardine canning season opened April 15, 1964, but no production of any consequence was expected until late May, when the fish usually arrive in inshore waters in adequate numbers for canning. Twenty-five canneries were put into operating condition to be ready for the schools of herring.

The size of the pack will depend upon the fish supply and market conditions and it is too early to predict either of those factors, according to the Executive Secretary of the Maine Sardine Council. He said that inventories held by the canners were slightly larger than normal but not enough so as to be burdensome. (Editor's Note: Canners' stocks of Maine sardines amounted to 1,063,000 standard cases on January 1, 1964, and 1,092,000 standard cases on January 1, 1963, according to the U. S. Bureau of the Census, Canned Food Report, January 1, 1964.) The Secretary further stated that Maine sardines now held more than 50 percent of the total U. S. sardine market and had been making a steady gain each month from the low point of 28 percent which occurred in 1961 and 1962 following the unusually small Maine sardine pack in 1961. (Maine Sardine Council, April 16, 1964.)

* * * * *

WORLD'S FAIR DISPLAY:

The Maine Sardine Council is participating in an outdoor food exhibit on the grounds of the New England Pavilion at the New York World's Fair, and the industry's products are featured in the Pavilion's Country Store and Restaurant.

The outdoor setting features the products of 12 New England food manufacturers through the use of large (4 x 6 feet), lighted photographs mounted on raised triangles of unusual design. The Council's message to the public hails Maine sardines as "the little brother of the Maine lobster" and advises that the product is healthful and nourishing and that more than 50 brands are on sale everywhere in the United States. The photograph shows numerous ways in which sardines may be prepared and served; boiled lobsters with netting and other gear are depicted in the background.

A sizable display of sardines is placed in the typical New England Country Store while the product is on the restaurant menu as a permanent item and is also served in the cocktail room as an appetizer. Recipe books and other material on Maine sardines are distributed at the State's information center within the New England Pavilion buildings.

The Maine State Department of Sea and Shore Fisheries is cooperating with the Council on the outdoor exhibit. (Maine Sardine Council, April 18, 1964.)

**National Fisheries Institute****AID TO UNITED STATES FISHING INDUSTRY PROPOSED AT CONVENTION:**

Bold measures are needed to bolster the Nation's fishing industry, Under Secretary James K. Carr of the U. S. Department of the Interior said April 25, 1964, at the National Fisheries Institute (NFI) Convention in Seattle, Wash. Citing an earlier arid land Federal reclamation program, the Under Secretary suggested the possibility of federally financed low-cost loans for construction of modern fishing vessels that would meet certain strict standards on size of vessel and equipment to make Americans more competitive with foreign fishermen.

The Under Secretary called upon members of NFI to consider some means of using Federal help along with other measures to revitalize the United States fishing industry.

He told the group if a man wants to build a \$150,000 vessel in Canada, he can go into business with a cash outlay of \$9,000. He said that even under legislation pending before the United States Congress to provide additional assistance, an American fisherman-owner would need a considerably larger cash outlay to put the same vessel in the water in competition with his Canadian neighbor.

The Interior Under Secretary said that in five years the catch of United States fishermen has dropped from second to fifth place in worldwide competition. He told the fish industry representatives, "now the United States is trailing Japan, the Soviet Union, Red China, and Peru." He declared the United States fishing fleet is antiquated in comparison to some modern fleets of other nations.

He pointed out that more than half of the world's population suffers from malnutrition or undernutrition, and that the importance of fish food proteins grows with each passing month. He told the group that the lifegiving food from the sea will be the great arsenal in the future battles against poverty, hunger, and disease. He also said, "In 1963, for the first time in the history of the Republic, over half (56 percent) of the United States fishery supply was derived from imports. In contrast, less than 14 years ago (in 1950), only 25 percent of the supply was imported."

**North Atlantic Fisheries Exploration and Gear Research****OCEAN PERCH GILLING BY TRAWL NETS STUDIED:**

M/V "Delaware" Cruise 64-1 (January 23-February 1, and February 5-27, 1964): To investigate the gilling effects upon ocean perch of 3-inch synthetic mesh trawl cod ends (approximately equivalent to 3.5-inch doubled manila mesh) as compared to commonly used 2.3-inch manila-twine cod ends was the principal purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The tests were made as part of a study to determine the effects of

a minimum-size 3-inch mesh on the fishing industry and on the fishery resources.

The two sizes of cod ends were changed and measured every 2 tows throughout the cruise to permit evaluation of ocean perch gilling. A total of 39 of the 63 tows made during the cruise caught sufficient fish to be of value in the study. Bad weather throughout the entire cruise and poor fishing in many areas limited the number of tows and the size of catches.

All tows were made off the coast of Nova Scotia with the majority taking place in in-shore waters ranging in depth from 72 to 100 fathoms. Some tows were also made in depths of 100 to 235 fathoms. The length of tows varied from 45 minutes to 2 hours. All fish gilled in the cod end were measured; males and females were weighed in separate groups. A random sample was taken from the fish free in the cod end for weight and length measurements.

Because of the adverse conditions and limited time, sufficient tows were not made to establish conclusive evidence on the difference between the gilling effects of the two cod ends. However, the test tows indicated that the 3-inch nylon cod end gilled more fish than the 2.3-inch double manila cod end. But the 3-inch nylon net allowed a relatively higher escapement than the 2.3-inch double manila. For complete analysis, all results were turned over to a representative of the International Commission for the Northwest Atlantic Fisheries.

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ELECTRICAL TRAWLING TESTS CONTINUED:

M/V "Delaware" Cruise 64-2 (March 11-April 3, 1964): To continue to test and evaluate the effect of an electric field upon the catch of a commercial otter-trawl net when the field is used as an adjunct to the net was the main purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. Work during the cruise was devoted to gear improvement and the determination of whether fish-size selectivity is possible through the use of varying pulse frequencies.

In accordance with the experience gained during Delaware Cruise 63-9, the electrical unit was successfully modified to provide a

pure pulse frequency throughout the electrical field. In addition, heavy coaxial conductor cable was used as the towing warp. A modification to the earlier method of attaching the doors also improved the handling quality of the gear and helped to eliminate previous difficulties.

The net transformers were mounted on the net headrope during the latter part of the cruise. That shift in position, from the foot-rope, appeared to be worthwhile. Not only were some electrical problems reduced but net handling was made easier.

Fishing operations were seriously hampered by weather conditions; however, 46 tows were made during the cruise.

A preliminary examination of fish-size selectivity data indicated that the electrical discharges applied during the cruise did not give the desired results. Future work will probably be conducted with an increase in the number of electrodes. Efforts to further reduce power requirements and to attain fish-size selectivity by species will be continued.

Note: See Commercial Fisheries Review, Jan. 1964 p. 21.

* * * * *

TUNA AND SWORDFISH SURVEY CONTINUED:

M/V "Delaware" Cruise 64-3 (April 16-June 5, 1964): The U. S. Bureau of Commercial Fisheries exploratory vessel M/V Delaware began a 51-day cruise on April 16, 1964, to continue a systematic survey of the distribution and abundance of tuna and swordfish in the North Atlantic. This is the eleventh long-line cruise in the series. During this cruise, special attention was given to waters off the Middle Atlantic Bight between the 100-fathom curve of the Continental Shelf and the western edge of the Gulf Stream. Emphasis was placed on giving coverage to those areas which have not been surveyed during previous investigations.

Operations of the Delaware included day and night sets of long-line gear to sample tuna and swordfish below the surface; daytime surface trolling to sample tuna in the upper water layer; bathythermograph transects to examine thermal relationships; tuna tagging in cooperation with the Woods Hole Oceanographic Institution to study seasonal tuna movements; and tuna blood sampling in cooperation with tuna subpopulation studies

being conducted at the U. S. Bureau of Commercial Fisheries biological laboratory in Honolulu, Hawaii.

Plans called for a commercial tuna-fishing vessel to cooperate with the project by fishing in the general area of the investigation and comparing its results with those of the Delaware.

Visiting scientists were aboard the Delaware as guest cooperators during the cruise. Two port calls were scheduled at Norfolk, Va.

Note: See Commercial Fisheries Review, Aug. 1963 p. 36.

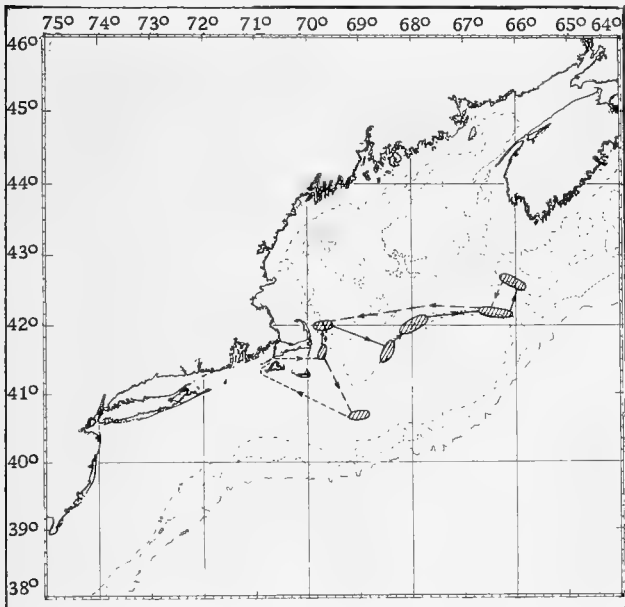


North Atlantic Fisheries Investigations

HADDOCK SPAWNING AND MATURITY INVESTIGATED:

M/V "Albatross IV" Cruise 64-3 (March 17-26, 1964): To collect blood samples from spawning populations of haddock, to record haddock maturity, and to collect live haddock were the objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. The area of investigation was Nausets, Chatham, Cultivator, Northern Edge and Browns Bank.

Trawling at 15 stations (23 tows) was made on a 12-hour a day basis. Blood samples



Shows sampling areas for Cruise 64-3 of the research vessel Albatross IV, March 17-26, 1964.

were taken from 25 haddock at each of the first 10 stations and tested with antisera for blood type. A total of 41 bathythermograph casts were made during the cruise.

Agglutination responses for 250 haddock were tabulated and the state of maturity was noted. Fertilized haddock eggs and live haddock were brought back to the Bureau's Biological Laboratory at Woods Hole, Mass.

Note: See Commercial Fisheries Review, April 1964 p. 23, February 1964 p. 36.

* * * * *

HADDOCK COLLECTION:

M/V "Albatross IV" Cruise 64-4 (April 6-8, 1964): To obtain live haddock for experimental purposes was the objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. A search was conducted on fishing grounds off Massachusetts, but haddock were not located where they could be hand-lined so no live specimens were obtained. Two trawl collections of haddock were made.

* * * * *

FLOUNDER TAGGING:

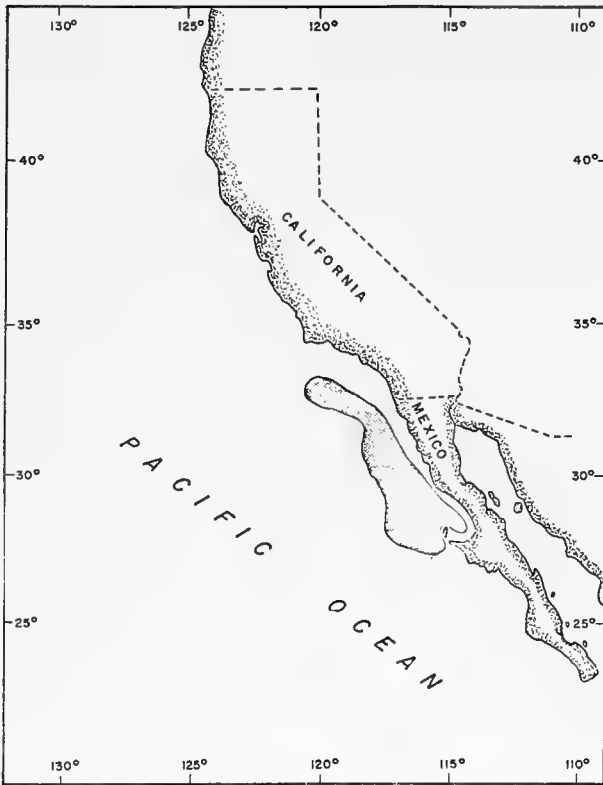
M/V "Albatross IV" Cruise 64-5 (April 8-14, 1964): To tag blackback flounder off New England in the area of Nantucket Shoals, Nauset Beach, and Georges Bank was the main objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. Blackback were caught by otter trawl at selected stations and tagged with Petersen disc tags. A total of 1,315 were tagged at Nantucket Shoals, 550 at Georges Bank, and 15 along Nauset Beach. Fin ray counts were made on some tagged and untagged blackbacks, and information on blackback spawning was also obtained. The cruise was cut short by mechanical difficulties.



North Pacific Exploratory Fishery Program

DISTRIBUTION AND ABUNDANCE OF ADULT HAKE OFF SOUTHERN CALIFORNIA AND NORTHERN MEXICO STUDIED:

M/V "John N. Cobb" Cruise 64 (February 5-March 19, 1964): Pelagic trawling for adult hake (*Merluccius productus*) during a predicted period of peak spawning was one of the principal objectives of this six-week cruise



Shows area of operations during John N. Cobb Cruise 64, February 5-March 19, 1964.

off southern California and northern Mexico by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb. Other objectives of the cruise were to: (1) attempt capture using standard and modified versions of the "Cobb" pelagic trawl; (2) evaluate three independent depth telemetry systems and a new type dual-frequency echo-sounding machine; and (3) determine configuration, drag ratio, and general utility of monofilament webbing in trawl construction.

A predetermined trackline and station pattern was followed during most of the cruise. Echo-soundings were made continuously along tracklines and during drags made at stations. Maximum depth tows to 250 fathoms were made at those stations where echo-soundings indicated an absence of marine life. Whenever echo-soundings indicated presence of marine life, tows were made at the indicated depth. Whenever relatively good echo-soundings were encountered, the station pattern was interrupted to allow repetitive drags and possible correlation of soundings with catches of hake.

Severe weather conditions during most of the cruise limited the number of drags to a total of 35. Adult hake in amounts up to 350 pounds per 1-hour tow were taken in five of the drags. Two drags made through a fair showing of fish during the latter part of the cruise yielded 300 and 150 pounds of hake, respectively. The concentration, centered at 250 fathoms, dispersed in the evening hours and attempts to relocate the shoal on the following day were fruitless.

A correlation was apparent between the vessel's hake catches and the occurrence of hake eggs and larvae as determined by the Bureau's research vessel Black Douglass. Good catches of eggs and larvae were made at stations adjacent to hake-producing drags.

Incidental fish catches were limited to small amounts of anchovies, bonitos, and deep-sea varieties such as lanternfish, fanged viperfish, and snipe eels.

Accurate determination of depth of tows was provided by three independent depth telemetry systems. Two of the systems utilized electrical core towing cable and one of the systems functioned via acoustic transmission. All three systems functioned well during the entire cruise. Variation of indicated depth as shown on each system was less than 2 percent. Performance of a new type electrical towing cable was excellent as no evidence of conductor damage or deterioration of steel strands was noted. A two-pen electronic strip chart recorder was used to record depth and water temperature during each drag.

A modified version of the "Cobb" pelagic trawl, constructed mainly of monofilament webbing, was shown to have approximately 20 percent less drag which allowed an average towing speed of three knots. A conventional "Cobb" pelagic trawl (also used on the cruise) averaged 2.5 knots.

The John N. Cobb was scheduled to depart Seattle April 13, 1964, for six weeks of exploratory bottom trawling (Cruise 65) off the Washington coast (from the Columbia River to the Strait of Juan de Fuca.) The primary objective is to locate new trawling grounds along the coast of Washington.

Note: See Commercial Fisheries Review, June 1963 p. 38.



Oceanography

RESEARCH VESSEL "OCEANOGRAPHER" LAUNCHED:

The Oceanographer, the largest and most modern oceanographic research vessel ever built in the United States, was launched April 18, 1964, at Jacksonville, Fla. The 303-foot

Built in 1897, it was commissioned by the Navy in World War I and was credited with sinking an enemy submarine. Again, in World War II, it saw service with the Navy in the Pacific. Between the two wars, the vessel was engaged in oceanographic research for the Coast and Geodetic Survey. The original Oceanographer was decommissioned in 1944



Artist's conception of the research vessel Oceanographer.

vessel is the first of two automated Class I oceanographic survey ships being built for the U. S. Coast and Geodetic Survey. The second vessel, the Discoverer, will be identical with the Oceanographer. The two vessels will cost \$14,000,000.

The Oceanographer, whose keel was laid in July 1963, is slated to be commissioned in 1965. A centralized control system in the engineroom will provide automatic starting and stopping of machinery, programming of the fuel and ballast system, and the automatic recording of operating data at a master-control station. In addition to automation, closed-circuit television will be provided throughout the engineroom.

The new ship is not the first to bear the name Oceanographer. It was preceded by a veteran of two world wars with a long and varied career. The first Oceanographer was originally a \$3-million luxury yacht.

and subsequently scrapped. (U. S. Coast and Geodetic Survey, April 15, 1964.)

Note: See Commercial Fisheries Review, Aug. 1963 p. 43.



Pollution

USE OF PESTICIDES ENDANGER COMMERCIAL FISHERIES SAYS INTERIOR SECRETARY:

Growing evidence of widespread environmental contamination from pesticides was cited by Secretary of the Interior Stewart L. Udall, who testified before a special Senate subcommittee called by Senator Ribicoff of Connecticut during early April 1964. The Secretary called for a nationwide pesticide monitoring program and an end to the use of highly toxic chemicals whose spread cannot be controlled. He said the problem of pesticides had become even more acute in recent

months and that new data were strengthening earlier warnings and demonstrating new hazards to man and wildlife.

The Secretary noted new evidence that DDT is responsible for the failure of lake trout to reproduce, and that it reduced reproductive success among several species of birds including pheasants, eagles, and black ducks. The most disturbing evidence now being accumulated, the Secretary said, points to the widespread existence of chemical pesticides following their use under "normal" and "controlled" conditions. Much data including that relating to recent fish kills on the lower Mississippi River does not relate to accidents or deliberate misuse, but are the apparently uncontrollable effects of widespread "normal" pesticide application.

Particular attention to the danger posed by pesticides to the commercial fisheries of the lower Mississippi and Gulf Coast areas was pointed out by the Secretary. Shrimp and other shellfish are almost unbelievably sensitive to certain pesticides, he said. The fishing industry--like the consumer in the supermarket--has no control over the way in which pesticides reach his product. Tens of thousands of jobs and millions of dollars of valuable fishery products may ultimately be at stake, Secretary Udall emphasized. He stated that "unlike farmers, our commercial fishermen do not use the pesticides themselves and they must depend on effective governmental action to prevent damage to the resources they depend upon for a living."



Preservation

IRRADIATION PRESERVATION OF FOOD STUDIED FOR COMMERCIAL IMPLICATIONS:

An extensive study of the commercial implications of the preservation of food by irradiation was announced April 2, 1964, by the U. S. Department of Commerce.

"Cooperative efforts among various governmental agencies including the Department of Defense and the Atomic Energy Commission have clearly indicated that the irradiation of food for the purposes of preserving it is perfectly safe and has many economic advantages," said the Administrator of the Commerce Department's Business and De-

fense Services Administration, which will coordinate the study. Explaining the purpose of the study, he stated, "The widespread use of such foods in the relatively near future will affect processing, storage, distribution, and marketing techniques for a great many food products. We want to learn in depth as soon as possible just what the implications are."

Aspects of the subject which will be studied include (1) the potential use of irradiated foods in providing proteins to developing areas which do not have conventional food storage facilities; (2) the question of winning consumer understanding and acceptance of irradiated foods; and (3) the impact of the irradiation food preservation technique upon other advanced methods of food processing such as freeze-drying.

The Department of Commerce is a member of the Interdepartmental Committee on Radiation Preservation of Food which has been collating promising developments in the field of food irradiation techniques. (U. S. Department of Commerce, April 2, 1964.)



Salmon

FRASER RIVER SOCKEYE LOSSES INVESTIGATED:

Studies into the environmental factors related to the serious mortality of unspawned Fraser River sockeye in 1961 and 1963 were carried out during the winter of 1964 by the staff of the International Pacific Salmon Fisheries Commission. The investigations revealed that several factors are involved in any excessive mortality regardless of the actual cause of death.

High or above normal temperatures and early arrival of the sockeye on the spawning grounds appear to be closely associated with any excessive loss of unspawned fish. Early timing in migration, while related to high temperature, appears to be the more important of the two factors. Density of spawners has been found to be a major factor when other influences are adverse, but seems of little importance when those influences follow a normal pattern.

Because of the complexity of the problem, fishery biologists need the advice of experts in other scientific fields. Once an understanding is reached of the cause or causes of

premature death in sockeye spawners, suitable controls possibly can be designed and placed in operation. While the costs of such controls may be high, the economic losses already sustained are also high. Remedial measures required to prevent such losses in the future could be economically justifiable.

In an attempt to develop a program to solve the problem, the Commission called a special meeting in New Westminster, B. C., Canada, April 20, 1964, which was attended by experts in the fields of biochemistry, physiology, ecology, pathology, and medicine. (International Pacific Salmon Fisheries Commission, April 15, 1964.)

* * * * *

NORTHWEST RIVERS RECEIVE RECORD PLANTS OF SILVER AND SPRING CHINOOK YEARLINGS:

In early April 1964, over 5.5 million yearling silver salmon fingerlings weighing a total of 160,000 pounds were released in rivers of Washington and Oregon. The fish were raised in three National Fish Hatcheries operated by the U. S. Fish and Wildlife Service. The plant included 590,000 silver salmon fingerlings which were released in Eagle Creek from the Eagle Creek National Fish Hatchery, near Estacada, Oreg. The Columbia River received the remainder of the fish, which included 2,300,000 from the Willard National Fish Hatchery, Willard, Wash., and 2,700,000 from the Little White Salmon National Fish Hatchery, Cook, Wash.

The April release was the largest plant of silver salmon fingerlings in the Northwest area from National Fish Hatcheries.

Northwest rivers also received a record plant of yearling spring chinook salmon from National Fish Hatcheries in April 1964 when 3 million spring chinook fingerlings were released from the Carson National Hatchery into the Wind River near Stevenson, Wash., and a total of 1,600,000 were released from the Eagle Creek National Hatchery into the Clackamas River, its tributary--Eagle Creek, and the Molalla River. The spring chinook yearlings were spawned by the 1962 runs of adult spring chinook salmon that ascended the new fishways on Eagle Creek and Wind River. Those streams became accessible to migrant salmon when fishways were constructed to bypass falls that were impassable.

The young salmon will migrate to the Pacific Ocean, where they will spend several years. Upon reaching maturity and returning to the Columbia River system, they will contribute to both the sport and commercial fisheries.

* * * * *

SITE OF FIRST PACIFIC COAST SALMON CANNERY DESIGNATED NATIONAL HISTORIC LANDMARK:

The site of the first Pacific Coast salmon cannery, built in Sacramento, Calif., 100 years ago, has been designated a National Historic Landmark, Congressmen Robert L. Leggett (Vallejo) and John E. Moss (Sacramento) of California announced this past April.

The site, which was determined by historians of the National Park Service of the U. S. Department of the Interior, is on the Yolo County side of the Sacramento River opposite the foot of Sacramento's K Street. A commemorative plaque was to be unveiled at the location on April 28, 1964. The principal speaker was to be Senator Bartlett of Alaska, a member of the Senate Merchant Marine and Fisheries Subcommittee. Lloyd Turna Cliff, a fish wholesaler in Sacramento and also a former vice president of the National Fisheries Institute, was to be master of ceremonies.

The forerunner of today's multimillion dollar Pacific salmon canning industry was begun in the spring of 1864 by three former Maine fishermen, two of whom were brothers. One of the brothers entered the fishing business in Sacramento in 1852 and was joined by his brother four years later. The business at first was limited to the sale of fresh and salted salmon. The third member to join the enterprise was a tinsmith as well as a fisherman and had experience canning lobster and salmon in New England. The newly formed company was short on capital, so he brought along some crude can-making equipment to Sacramento with him.

In the spring of 1864, the three partners enlarged the original cabin and purchased a large scow for additional factory floor space. They added an 18 by 24-foot extension to the cabin of the scow for a can-making shop. The salmon were packed in salted water, and the cans were boiled about an hour at 230 degrees. Later a pickle was added to each can to replace the salt. The cans were painted a bright red with a combination of red lead, turpentine,

and linseed oil. As a result, the consumer identified canned salmon only by the flaming red can even when there was no label.

The new company had a difficult time at the beginning. The equipment they had was crude and every operation had to be done by hand. At least half the cans manufactured in the first year burst at the seams. Despite, the handicaps, the company sold 2,000 cases at \$5 per dozen cans the first year, and the business was launched. Because of the success of this first cannery, numerous other canneries sprang up. By 1882 there were 20 canneries along the Sacramento River producing about 200,000 cases of salmon a year. After that peak year the industry declined because of a sharp reduction in the number of salmon entering the Sacramento River. The shortage of fish was attributed to silting of the river by hydraulic mining and salmon canning on the Sacramento River was discontinued after 1919.

The original and first salmon-canning company was gone long before the peak pack of 1882. A decline in salmon runs in the Sacramento in 1865 started the partners of that first cannery looking for a better source of supply. The following year they moved to Eagle Cliff, Wash., and established a cannery there.

Today's \$100 million salmon-canning industry in the United States is a direct outgrowth of the pioneering efforts of that first salmon-canning enterprise in Sacramento. The Alaska canned salmon pack in 1963 totaled 2.7 million cases, or about 80 percent of the total United States canned salmon pack of 3.3 million cases. The remainder was packed by canneries in Washington and Oregon.



Shrimp

UNITED STATES:

Breaded Production, 1963: Breaded shrimp production during the fourth quarter of 1963

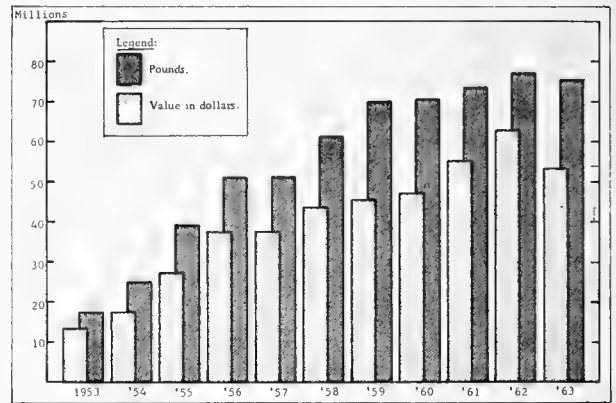
| Month | Quantity 1,000 Lbs. |
|--------------------|------------------------|
| October | 7,390 |
| November | 6,129 |
| December | 5,513 |
| Total | 19,032 |

| Area | No. of Plants | 1963 (1,000 Lbs.) | | |
|---------------------------|---------------|----------------------|----------|----------|
| | | October | November | December |
| Atlantic States | 19 | 2,175 | 1,962 | 1,458 |
| Gulf and Inland States | 16 | 4,715 | 3,680 | 3,566 |
| Pacific States | 8 | 500 | 487 | 489 |
| Total | 43 | 7,390 | 6,129 | 5,513 |

| State | No. of Plants | 1,000 Pounds | 1,000 Dollars |
|---|---------------|--------------|---------------|
| Massachusetts, New York, and New Jersey | 8 | 2,029 | 1,835 |
| Pennsylvania and Virginia | 4 | 623 | 648 |
| Georgia | 6 | 14,298 | 8,477 |
| Florida | 10 | 22,992 | 17,282 |
| Louisiana and Alabama | 6 | 3,016 | 1,790 |
| Texas | 9 | 26,535 | 18,850 |
| Arizona and California | 9 | 5,546 | 4,156 |
| Total | 52 | 75,039 | 53,038 |

was 19 million pounds and for the entire year it was 75 million pounds, according to preliminary data.

Breaded shrimp production has gradually increased over the years. From production of 6.6 million pounds in 1950 with a wholesale value of \$4.2 million, the quantity increased



U. S. production and value of breaded shrimp 1953-63.

to 77.3 million pounds with a value of \$62.8 million in 1962--a record year. Compared with the peak year, production in 1963 was three percent less in volume and 16 percent less in value.

* * * * *

Supply and Disposition, 1961-1963: The available United States shrimp supply in 1963 was 16.7 percent greater than in 1962 and increased 30.4 percent from 1961. United States shrimp imports again were at a record high

| U. S. Supply and Disposition of Shrimp, 1961-63 | | | | |
|--|-------------|-----------|-----------|-----------|
| Item | | 1/1963 | 2/1962 | 1961 |
| (1,000 Lbs. shell-on) | | | | |
| Supply: | | | | |
| Domestic landings | heads-on | 240,300 | 191,105 | 174,494 |
| " | (heads-off) | (150,244) | (119,154) | (103,865) |
| Foreign product of U. S. fisheries ^{3/} | heads-on | - | 479 | - |
| " | (heads-off) | (-) | (301) | (-) |
| Imports ^{4/} | heads-on | 266,205 | 242,580 | 213,957 |
| " | (heads-off) | (167,344) | (152,504) | (134,564) |
| Total supply | heads-on | 506,505 | 434,164 | 388,451 |
| " | (heads-off) | (317,588) | (271,959) | (238,429) |
| Disposition (approximate) | | | | |
| Frozen: | | | | |
| Headless ^{5/} | heads-on | 6/ | 253,935 | 238,901 |
| " | (heads-off) | (5/) | (199,708) | (147,625) |
| Meat, raw (includes some cooked) ^{5/} | heads-on | 6/ | 81,959 | 81,107 |
| " | (heads-off) | (5/) | (51,045) | (49,810) |
| Meat, cooked ^{5/} | heads-on | 6/ | 15,202 | 8,114 |
| " | (heads-off) | (5/) | (9,568) | (4,830) |
| Breaded | heads-on | 6/ | 77,698 | 74,717 |
| " | (heads-off) | (5/) | (48,950) | (44,505) |
| Specialties | heads-on | 8/ | 1,011 | 574 |
| " | (heads-off) | (5/) | (692) | (342) |
| Total frozen | heads-on | 399,060 | 342,240 | 318,428 |
| " | (heads-off) | (250,474) | (214,693) | (196,524) |
| Canned | heads-on | 68,266 | 56,522 | 41,484 |
| " | (heads-off) | (42,479) | (35,604) | (24,872) |
| Dried | heads-on | 7,531 | 3,296 | 4,499 |
| " | (heads-off) | (4,730) | (2,069) | (2,722) |
| Fresh | heads-on | 27,000 | 25,000 | 24,000 |
| " | (heads-off) | (16,981) | (15,723) | (14,286) |
| Unclassified | heads-on | 4,648 | 7,106 | 40 |
| " | (heads-off) | (2,924) | (4,469) | (25) |

1/ Preliminary.
 2/ Revised.
 3/ Caught by domestic craft, principally in waters off Central America, and shipped to the United States. Reported by the U. S. Bureau of the Census as "Products of the American Fisheries."
 4/ The composition of imported shrimp was compiled from data assembled by the U. S. Bureau of the Census, U. S. Tariff Commission, and the U. S. Bureau of Commercial Fisheries Market News Service field offices. Imports by commodities listed below were converted to heads-on weight by multiplying the quantity of headless shrimp by 1.59, meat by 2.04, breaded by 1.00, canned by 2.21, dried by 7.69, and unclassified by 1.59.

| Item | 1963 (prel.) | 1962 (rev.) | 1961 |
|--------------------------|--------------|-------------|----------|
| (1,000 lbs.) | | | |
| Shrimp: | | | |
| Headless | 111,717 | 108,628 | 101,208 |
| Meat, raw | 29,460 | { 22,703 | { 22,287 |
| Meat, cooked | 2,547 | { 1,995 | { 922 |
| Breaded | 484 | { 421 | { 1,659 |
| Canned | 4,120 | { 2,911 | { 1,659 |
| Dried | 279 | { 56 | { 167 |
| Unclassified | 2,923 | { 4,469 | { 25 |
| Total | 151,530 | 141,183 | 126,268 |

5/ May include some fresh products.
 6/ Not available.

in 1963 having increased 9.7 percent from the previous year and were up 24.4 percent from the 1961 imports.

Domestic shrimp landings for 1963 were the best in many years -- 25.7 percent more than in 1962 and up 37.7 percent from 1961. The 1963 shrimp landings at ports in the Gulf of Mexico were the largest since the collection of detailed statistical records was begun in 1956 by the U. S. Bureau of Commercial Fisheries. Louisiana's 1963 shrimp landings of slightly more than 90 million pounds (heads-on weight) were double those of the previous year, but the ex-vessel value increased only about 30 percent from 1962. But shrimp landings for the year at South Atlantic ports were the lightest in many years.

Note: See Commercial Fisheries Review, May 1963 p. 42.

Supply Indicators, March 1964:

| Item and Period | 1964 | 1963 | 1962 | 1961 | 1960 |
|---|---------|---------|---------|---------|---------|
| (1,000 Lbs. Heads-Off) | | | | | |
| Total landings, So. Atl. and Gulf States: | | | | | |
| May | - | 10,152 | 6,186 | 5,276 | 6,335 |
| April | - | 4,427 | 3,358 | 3,171 | 4,728 |
| March | 4,700 | 3,632 | 3,331 | 4,754 | 4,099 |
| February | 4,249 | 3,986 | 4,123 | 3,910 | 3,784 |
| January | 6,160 | 3,993 | 3,840 | 5,686 | 5,402 |
| January-December | - | 138,281 | 105,839 | 91,396 | 141,035 |
| Quantity canned, Gulf States 1/: | | | | | |
| May | - | 3,831 | 1,794 | 1,208 | 1,461 |
| April | - | 105 | 12 | 9 | 66 |
| March | 12 | 92 | 86 | 35 | 117 |
| February | 309 | 301 | 241 | 90 | 204 |
| January | 325 | 449 | 492 | 183 | 266 |
| January-December | - | 29,468 | 23,322 | 14,500 | 26,394 |
| Frozen inventories (as of end of each mo.) 2/: | | | | | |
| May 31 | - | 24,053 | 13,904 | 24,696 | 17,540 |
| April 30 | - | 24,954 | 15,637 | 27,492 | 20,502 |
| March 31 | - | 27,970 | 16,607 | 31,345 | 23,232 |
| February 29 | 35,303 | 28,039 | 19,012 | 37,612 | 29,063 |
| January 31 | 43,752 | 28,487 | 21,328 | 37,842 | 34,332 |
| January 1 | 45,335 | 31,577 | 19,755 | 40,913 | 37,666 |
| Imports 3/: | | | | | |
| May | - | 11,110 | 11,020 | 8,278 | 9,902 |
| April | - | 11,082 | 10,210 | 9,208 | 7,733 |
| March | - | 13,616 | 9,658 | 10,347 | 8,545 |
| February | 11,690 | 12,100 | 10,599 | 8,932 | 7,657 |
| January | 13,272 | 13,139 | 12,907 | 12,338 | 8,596 |
| January-December | - | 151,530 | 141,103 | 126,268 | 113,418 |
| (¢/lb., 26-30 Count, Heads-Off) | | | | | |
| Ex-vessel price, all species, So. Atl. and Gulf Ports: | | | | | |
| May | - | 80.9 | 83.7 | 52.8 | 62.9 |
| April | - | 83.6 | 82.2 | 55.4 | 60.6 |
| March | 4/57-61 | 85.5 | 80.9 | 56.0 | 56.3 |
| February | 4/57-62 | 85.7 | 78.9 | 53.5 | 51.8 |
| January | 4/57-69 | 85.0 | 76.3 | 52.5 | 49.5 |
| Wholesale price, froz. brown (5-lb. pkg.) Chicago, Ill.: | | | | | |
| May | - | 100-103 | 96-103 | 67-69 | 74-77 |
| April | - | 100-105 | 94-97 | 69-70 | 74-75 |
| March | 72-75 | 102-106 | 94-95 | 69-71 | 65-68 |
| February | 73-82 | 102-106 | 93-95 | 69-71 | 65-67 |
| January | 78-83 | 102-106 | 91-94 | 69-71 | 64-66 |

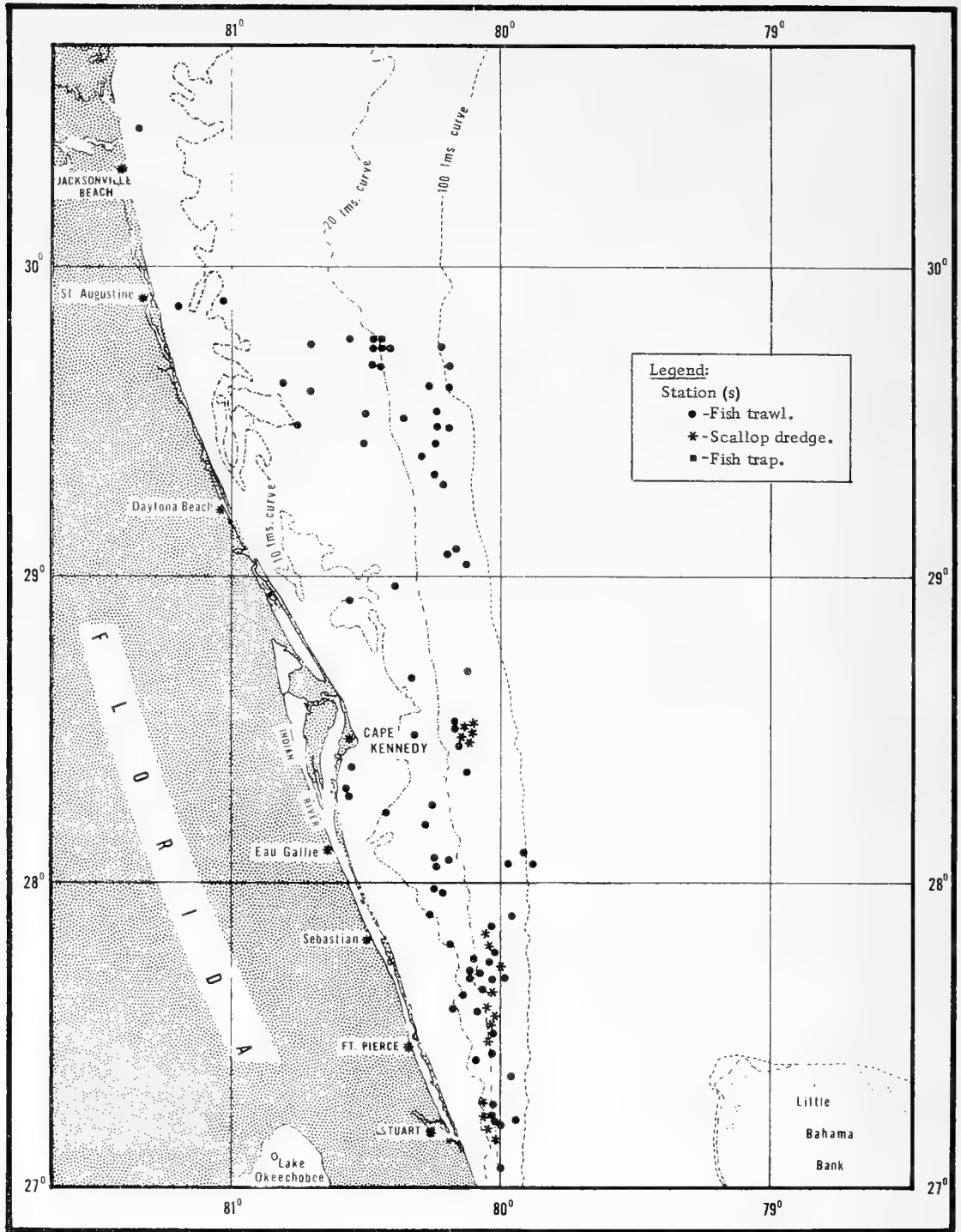
1/ Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3.
 2/ Raw headless only; excludes breaded, peeled and deveined, etc.
 3/ Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
 4/ Range in prices at Tampa, Fla.; Morgan City, La.; area; Port Isabel and Brownsville, Tex. only.
 Note: March 1964 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.66.



South Atlantic Exploratory Fishery Program

TRAWLING SURVEY OFF FLORIDA EAST COAST:

M/V "Silver Bay" Cruise 55 (February 26-March 13, 1964): To conduct a fish trawling survey off the east coast of Florida between Summer Haven and Jupiter Inlet was the primary objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay.

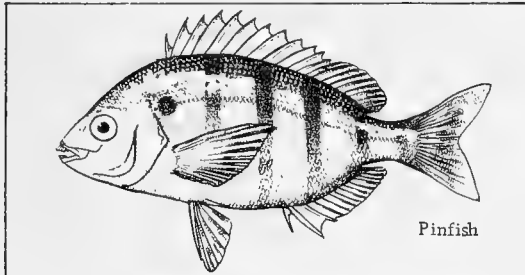


Area investigated off Florida's east coast during Cruise 55 of the M/V Silver Bay, February 26-March 13, 1964.

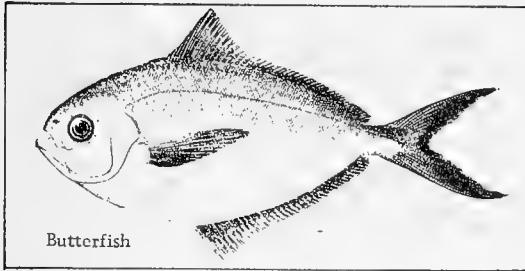
A total of 105 exploratory fishing stations was occupied in that area ranging from depths of 6 to 110 fathoms. Exploratory gear consisted primarily of 50/70 foot $4\frac{1}{2}$ -inch mesh, nylon roller-rigged fish trawls fished on 8-foot bracket doors with 15-foot leg lines. Cod ends were $1\frac{1}{2}$ -inch mesh. Trawling conditions were favorable throughout the area except at the edge of the Continental Shelf in 30 to 60 fathoms. Most catches were small with only occasional captures of commercially important species.

Only moderate numbers of sharks and rays were taken from 8 drags in depths less than 10 fathoms.

A total of 36 drags was made in the 11- to 20-fathom depth range. In those depths, moderate catches of butterfish (*Poronotus*), grunts (*Haemulon*), and pinfish (*Lagodon*) were made



Pinfish



Butterfish

near Bethel Shoals. Catches of from 750 to 1,500 pounds of small (2- to 4-count) spots (*Leiostomus*), croakers (*Micropogon*), and drums were made off Cape Kennedy. Extensive fish-school tracings were recorded on the depth-recorder off Summer Haven in 20 fathoms. Several drags in that area showed that the fish schools consisted of filefish (*Stephanolepis hispidus*). One 90-minute drag yielded 8,000 pounds of that species. On the same drag, 475 pounds of red, grey, and mutton snappers (*L. aya*, *L. griseus*, and *L. analis*), and 125 pounds of large porgies and sheepshead were also taken. That area appeared to be the southern boundary of the

extensive "broken bottom" areas previously delineated by the Silver Bay off northern Florida.

In depths greater than 21 fathoms, only occasional small catches of snappers, groupers, or other commercially-valuable fish were made. Fish-searching transects and catch results both indicated that large fish concentrations were not present in those depth ranges during the survey period.

Calico scallops (*Pecten gibbus*) were taken throughout the survey area. Samples of commercial-size scallops requested by industry were provided for machinery tests. At the time of this cruise the scallop population comprised two size groups--the 50- to 55-millimeter (2- to $2\frac{1}{4}$ -inch) mature size group, and the 35- to 45-millimeter ($1\frac{1}{2}$ - to $1\frac{3}{4}$ -inch) maturing size group. The best scallop catches (4 to 5 bushels of shell stock per 30-minute tow) were made in the following areas: 16 fathoms off New Smyrna, 26 fathoms east of Cape Kennedy, 25 fathoms southeast of Bethel Shoals, and 20 fathoms east of St. Lucie Inlet.

Night catches of rock shrimp (*Sicyonia brevirostris*) were made with the large-mesh fish trawls in several areas. Best catches were made in 20 fathoms east of St. Lucie Inlet, where up to 110 pounds of 31-36 count (heads-on) shrimp were taken per 90-minute tow. A 40-pound catch of that shrimp species was made in 14 fathoms east of Hetzel Shoal.

Note: See Commercial Fisheries Review, May 1964 p. 32.



U. S. Fishing Vessels

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, JANUARY 1-MARCH 31, 1964:

From the beginning of the program in 1956 through March 31, 1964, a total of 1,384 loan applications for \$38,155,392 were received by the U. S. Bureau of Commercial Fisheries, the Agency administering the Federal Fisheries Loan Fund. Of the total, 710 applications (\$15,929,360) have been approved, 473 (\$11,729,849) have been declined or found ineligible, 160 (\$6,106,422) have been withdrawn by the applicants before being processed, and 41 (\$2,685,170) are pending. Of the applications approved, 282 were approved for amounts less than applied for. The total reduction was \$1,704,591.

The following loans were approved from January 1, 1964, through March 31, 1964:

New England Area: George F. Hume, Boothbay Harbor, Maine, \$5,000; Alfred S. Osgood, Vinalhaven, Maine, \$4,900.

California: Clark W. Washburn, Crescent City, \$6,570; Jack J. Riso, Monterey, \$11,212; and Dewey H. Vanderpool, Pinole, \$7,177.

Pacific Northwest Area: Ronald E. Bowhay, Bellingham, Wash., \$15,000; Howard V. Rawley, Ferndale, Wash., \$6,500; Charles R. Beechey, Ocean Park, Wash., \$2,500; Henry P. Wold, Quinault, Wash., \$7,500; Andreas Arntsen, Seattle, Wash., \$28,000; Harry A. Hebert, Seattle, Wash., \$13,500; William A. Monroe, Seattle, Wash., \$3,191; Sven H. Svenson, Seattle, Wash., \$15,000; and Charles M. Thatcher, Tacoma, Wash., \$2,800.

Alaska: Ernest J. Heald, Anchorage, \$8,450; Eugene D. Smith, Coho, \$3,600; Robert B. Sandstrom, Haines, \$12,400; Charles Simon, Jr., Kasilof, \$7,850; Johnnie W. Huff and Lora Mae Huff, Ketchikan, \$8,400; Oral L. Burch and Alvin R. Burch, Seward, \$6,036; and George Rohrer, Sitka, \$9,534.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the first quarter of 1964, a total of 11 applications for \$429,858 were received and 7 applications for \$282,402 were approved. Since the program began (July 5, 1960), 50 applications were received for \$4,741,309. Of the total, 33 applications were approved for \$2,588,212 and 11 applications for \$672,895 were pending as of March 31, 1964. Since the mortgage program began, applications received and approved by area are:

New England Area: Received 11 (\$1,054,500), approved 8 (\$775,365).

California Area: Received and approved 1 (\$557,000).

South Atlantic and Gulf Area: Received 28 (\$81,228,815), approved 19(\$708,301).

Pacific Northwest Area: Received 7 (\$1,846,250), approved 4 (\$507,546).

Alaska Area: Received 3 (\$54,744), approved 1 (\$40,000).

No applications for the Fishing Vessel Construction Differential Subsidy were received from January through March 31, 1964, as the authority to accept applications expired on June 12, 1963. Since the beginning of that program on June 12, 1960, 13 applications were received for \$1,101,770, of which 7 applications were approved for \$624,370, and 6 applications for \$477,400 were pending.

* * * * *

DOCUMENTATIONS ISSUED AND CANCELLED:

February 1964: During February 1964, a total of 30 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 26 in February 1963. There were 36 documents cancelled for fishing vessels in February 1964 as compared with 25 in February 1963.

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, February 1964 with Comparisons

| Area (Home Port) | Feb. | | Jan.-Feb. | | Total 1963 |
|---------------------------------------|-----------|-----------|-----------|-----------|---------------|
| | 1964 | 1963 | 1964 | 1963 | |
| (Number) | | | | | |
| <u>Issued first documents 2/:</u> | | | | | |
| New England | 1 | 2 | 2 | 3 | 23 |
| Middle Atlantic | 1 | - | 2 | 1 | 18 |
| Chesapeake | - | 3 | 5 | 3 | 66 |
| South Atlantic | 5 | 5 | 10 | 7 | 77 |
| Gulf | 20 | 11 | 37 | 23 | 239 |
| Pacific | 3 | 5 | 6 | 9 | 160 |
| Great Lakes | - | - | 1 | - | 5 |
| Puerto Rico | - | - | - | - | 2 |
| Total | 30 | 26 | 63 | 46 | 590 |
| <u>Removed from documentation 3/:</u> | | | | | |
| New England | 5 | 1 | 6 | 2 | 48 |
| Middle Atlantic | 1 | 6 | 3 | 10 | 47 |
| Chesapeake | 5 | 2 | 9 | 3 | 25 |
| South Atlantic | 6 | 3 | 10 | 10 | 53 |
| Gulf | 11 | 5 | 20 | 10 | 118 |
| Pacific | 8 | 8 | 15 | 15 | 87 |
| Great Lakes | - | - | 5 | 2 | 15 |
| Hawaii | - | - | - | - | 3 |
| Total | 36 | 25 | 68 | 52 | 396 |

Note: For explanation of footnotes, see table 3.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, February 1964

| Gross Tonnage | Issued 2/ | Cancelled 3/ |
|---------------|----------------------|--------------|
| | (Number) | |
| 5-9 | 1 | 7 |
| 10-19 | 3 | 9 |
| 20-29 | 4 | 8 |
| 30-39 | 4 | - |
| 40-49 | - | 5 |
| 50-59 | 5 | 1 |
| 60-69 | 5 | 1 |
| 70-79 | 5 | - |
| 90-99 | 2 | 1 |
| 120-129 | - | 1 |
| 140-149 | - | 1 |
| 200-209 | - | 1 |

(Table continued on next page)

| Gross Tonnage | Issued ^{2/} | Cancelled ^{3/} |
|--------------------|----------------------|-------------------------|
| | (Number) | |
| 220-229 | 1 | - |
| 250-259 | - | 1 |
| Total | 30 | 36 |

Table 3 - U. S. Fishing Vessels--Documents Issued, by Vessel Length, February 1964

| Length Feet | Issued ^{1/} Number |
|--------------------|-----------------------------|
| 30-40. | 6 |
| 40-50. | 5 |
| 50-60. | 5 |
| 60-70. | 12 |
| 70-80. | 1 |
| 110-120. | 1 |
| Total | 33 |

^{1/}Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
^{2/}There were no redocumented vessels in February 1964 previously removed from records. Vessels issued first documents as fishing craft were built: 21 in 1964; 7 in 1963; 1 in 1962; and 1 prior to 1951.
^{3/}Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
 Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

* * * * *

January 1964: During January 1964, a total of 33 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 20 in January 1963. There were 32 documents cancelled for fishing vessels in January 1964 as compared with 27 in January 1963.

Table 1 - U. S. Fishing Vessels ^{1/}--Documentations Issued and Cancelled, by Areas, January 1964 with Comparisons

| Area (Home Port) | Jan. | | Total 1963 |
|--|------------------|-----------|------------|
| | 1964 | 1963 | |
| | ... (Number) ... | | |
| Issued first documents ^{2/}: | | | |
| New England | 1 | 1 | 23 |
| Middle Atlantic | 1 | 1 | 18 |
| Chesapeake | 5 | - | 66 |
| South Atlantic | 5 | 2 | 77 |
| Gulf | 17 | 12 | 239 |
| Pacific | 3 | 4 | 160 |
| Great Lakes | 1 | - | 5 |
| Puerto Rico | - | - | 2 |
| Total | 33 | 20 | 590 |
| Removed from documentation ^{3/}: | | | |
| New England | 1 | 1 | 48 |
| Middle Atlantic | 2 | 4 | 47 |
| Chesapeake | 4 | 1 | 25 |
| South Atlantic | 4 | 7 | 53 |
| Gulf | 9 | 5 | 118 |
| Pacific | 7 | 7 | 87 |
| Great Lakes | 5 | 2 | 15 |
| Hawaii | - | - | 3 |
| Total | 32 | 27 | 396 |

Note: For explanation of footnotes, see table 3.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, January 1964

| Gross Tonnage | Issued ^{2/} | Cancelled ^{3/} |
|---------------|----------------------|-------------------------|
| | (Number) | |
| 5-9 | 7 | 6 |
| 10-19 | 6 | 15 |

(Table continued on next column)

| Gross Tonnage | Issued ^{2/} | Cancelled ^{3/} |
|--------------------|----------------------|-------------------------|
| | (Number) | |
| 20-29 | 3 | 3 |
| 30-39 | 1 | 2 |
| 40-49 | 2 | 1 |
| 50-59 | 1 | - |
| 60-69 | 3 | 3 |
| 70-79 | 9 | 1 |
| 80-89 | 1 | - |
| 120-129 | - | 1 |
| Total | 33 | 32 |

Note: For explanation of footnotes, see table 3.

Table 3 - U. S. Fishing Vessels--Documents Issued, by Vessel Length, January 1964

| Length Feet | Issued ^{1/} Number |
|--------------------|-----------------------------|
| 20-30. | 3 |
| 30-40. | 10 |
| 40-50. | 5 |
| 50-60. | 2 |
| 60-70. | 13 |
| Total | 33 |

^{1/}Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
^{2/}Vessels issued first documents as fishing craft were built: 5 in 1964; 2 in 1963; 1 in 1961; 2 in 1960; and 4 prior to 1951.
^{3/}Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
 Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U.S. Foreign Trade

PROCESSED EDIBLE FISHERY PRODUCTS, FEBRUARY 1964:

United States imports of processed edible fishery products in February 1964 were down 27.4 percent in quantity and 26.4 percent in value from those in the previous month. There was a sharp drop in imports of fish blocks and slabs (decline mainly in shipments from Canada) and canned sardines not in oil (decline mainly in shipments from South Africa Republic). Shipments were also down for most other processed edible fishery products, except haddock fillets.

Compared with the same month in 1963, imports in February 1964 were down 8.6 percent in quantity and 6.3 percent in value. Imports of canned sardines not in oil were much lower this February. Imports were also down for most other canned fishery products, except canned sardines in oil. The decline was partly offset by heavier arrivals of groundfish fillets, flounder fillets, sea catfish fillets, and yellow pike fillets.

U. S. Imports and Exports of Processed Edible Fishery Products, February 1964 with Comparisons

| Item | Quantity | | | | Value | | | |
|-----------------------|--------------------------------|------|-----------|------|------------------------------|------|-----------|------|
| | Feb. | | Jan.-Feb. | | Feb. | | Jan.-Feb. | |
| | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 | 1964 | 1963 |
| | (Millions of Lbs.) | | | | (Millions of \$) | | | |
| Imports ^{1/} | 35.7 | 38.8 | 84.9 | 77.6 | 10.3 | 11.0 | 24.3 | 21.3 |
| Exports ^{2/} | 5.0 | 4.2 | 9.4 | 7.9 | 2.2 | 1.3 | 3.7 | 2.9 |

^{1/}Includes only those fishery products classified by the U. S. Bureau of the Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i. e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).
^{2/}Excludes fresh and frozen.

In the first 2 months of 1964, imports were up 9.4 percent in quantity and 14.0 percent in value from those in the same period of 1963. During January-February 1964 there were larger imports of cod fillets, ocean perch fillets, flounder fillets, blocks and slabs, sea catfish fillets, yellow pike fillets, canned tuna in brine, and canned sardines in oil, but imports were down for haddock fillets, halibut fillets, swordfish fillets, canned sardines not in oil, and canned crab meat.

Exports of processed edible fish and shellfish from the United States in February 1964 were up 13.6 percent in quantity and 46.7 percent in value from those in the previous month. An increase in exports of canned squid and the higher-priced canned salmon and canned shrimp was partly offset by a decline in shipments of canned mackerel and canned sardines.

Compared with the same month of the previous year, the exports in February 1964 were up 19.0 percent in quantity and 69.2 percent in value. Exports of canned salmon and canned mackerel were up, while shipments of canned sardines and canned squid declined.

Processed fish and shellfish exports in the first 2 months of 1964 were up 19.0 percent in quantity and 27.6 percent in value from those in the same period of 1963. In January-February 1964 there were much larger shipments of canned mackerel and shipments of canned salmon and canned shrimp were also higher, but exports of canned sardines not in oil and canned squid were down sharply.

Notes: (1) Prior to October 1963, the data shown were included in news articles on "U. S. Imports and Exports of Edible Fishery Products." Before October 1963, data showing "U. S. Imports of Edible Fishery Products" summarized both manufactured and crude products. At present, a monthly summary of U. S. imports of crude or nonprocessed fishery products is not available; therefore, only imports of manufactured or processed edible fishery products are reported. The import data are, therefore, not comparable to previous reports of "U. S. Imports of Edible Fishery Products."
The export data shown are comparable to previous data in "U. S. Exports of Edible Fishery Products." The export data in this series of articles have always been limited to manufactured or processed products.

(2) See Commercial Fisheries Review, May 1964 p. 35.



Washington

STEELHEAD TROUT INCIDENTAL CATCH MINIMIZED BY LARGER MESH NETS:

An experimental 8-day gill-net fishery in Grays Harbor, Wash., conducted by the Washington State Department of Fisheries during the first 2 weeks of December 1963 gave strong evidence that the use of nets with large mesh (7½ inches or larger) definitely minimizes the incidental catch of steelhead trout. During the test, a total of 359 silver salmon and 22 steelhead trout were caught.

One chartered vessel using standard (6⅝-inch) mesh during 3 days in early December caught 4 silvers and 11 steelhead, of which 5 were released in good condition. A group of chartered vessels taking part in the test during the second week in December used nets with mesh of 7½ inches or larger and caught 44 silvers and 8 steelhead. All 8 trout were released in good condition.

Observations during the test confirmed the belief that seals are a serious predator

on both steelhead trout and silver salmon in the Grays Harbor area. (Washington State Department of Fisheries, April 1, 1964.)

* * * * *

PURSE-SEINE VESSEL CHARTERS SOUGHT BY DEPARTMENT OF FISHERIES:

The Washington State Department of Fisheries announced on April 22, 1964, that it wished to charter three purse-seine vessels and nets for salmon tagging at the following areas: West Beach, Rosario Strait, Iceberg Point, Salmon Banks, Lime Kiln, Mitchell Bay and Stuart Island. One of the requirements in bidding for a charter was that a shipper must be familiar with at least two of the above areas and be able to demonstrate that he had been successful in fishing for silver salmon in those areas.

The charters will total a maximum of 20 fishing days per vessel and work will be done during the weekly 2- and 3-day closures of Puget Sound to commercial net fishing beginning on or about August 23, 1964. Charter will be on a per-day basis with no minimum season guarantee. Payment will be made for any day on which the net is set regardless of length of time fished. A bonus of a dollar per fish will be paid for every silver salmon tagged over a total of 160 per day.

No bids were considered that were in excess of \$300 per day for drum seines and \$350 per day for power-block seines. Such limits would not prevent payment of the bonus of one dollar for each silver salmon tagged in excess of 160 per day.

To be considered, a vessel had to be over 40 feet in length, large enough to handle two 36-inch circular fish tanks on deck, equipped with a deck pump for circulating sea water, and have adequate life-saving equipment. The fishing ability of the skipper, as well as general condition of the vessel, net, and working space were all considered in awarding the charters.

The fisherman will furnish all fishing gear, including losses, fuel, food, crew, boat insurance, and other vessel requirements. Charter will include meals for two biologists, except when in port. The net used must be in good condition and be of a standard size for areas to be fished.

One or more Washington State Department of Fisheries staff members will be aboard at all times when the net is fishing.

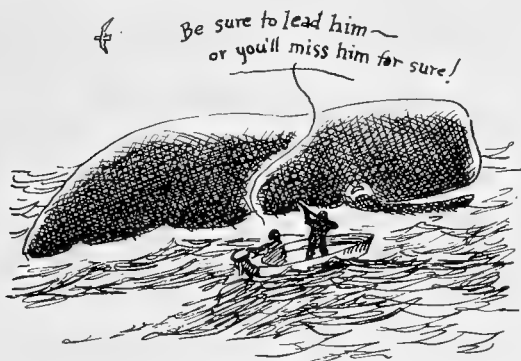
Bids were received by the Washington State Department of Fisheries until May 14, 1964.



Whales

WHALE MARKING PROJECT OFF SOUTHERN CALIFORNIA:

A three-week whale-marking cruise off southern California was begun in January 1964 by the Lynn Ann, a chartered research vessel of the U. S. Bureau of Commercial Fisheries. The project is part of an international program to conserve the world's populations of whales.



A total of 59 whale marks were fired during this cruise and 34 whales were estimated to have been effectively marked. The marked whales were 27 sperm whales, 5 graywhales, 1 fin whale, and 1 humpback whale. Twenty-six fin whales, 6 sei whales, 1 humpback whale, 46 gray whales, and about 180 sperm whales were sighted. One killer whale and 3 dolphins were collected. Gray whales were seen farther offshore than formerly observed and this raises some question in the index placed on land-based shore counts.

In marking whales, an 8-inch, hollow, stainless-steel tube with a lead cap--or whale mark--is fired from a specially designed shotgun. The tube carries instructions requesting anyone recovering the marker to return it to the National Institute of Oceanography in England.

The United States takes an active part in the work of the International Whaling Commission which resulted from a pact signed by 17 nations in Washington, D. C., on December 2, 1964. The U. S. Bureau of Com-

mmercial Fisheries carries out the Federal Government's responsibilities in the conservation of whales and has a staff member serving on the Commission.



Wholesale Prices

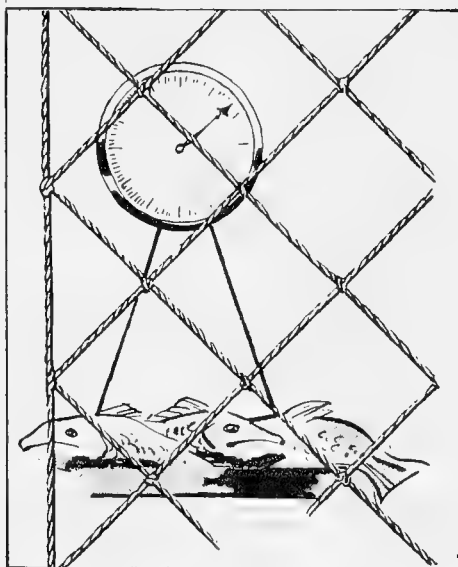
EDIBLE FISH AND SHELLFISH, APRIL 1964:

The April 1964 wholesale price index for edible fish and shellfish (fresh, frozen, and canned) dropped 1.0 percent from the previous month. With few exceptions, prices this April were generally lower for most of the fishery products listed than in March. At 103.1 percent of the 1957-59 average, the index this April was 9.2 percent lower than the same month a year earlier.

From March to April 1964, the drawn, dressed, or whole finfish subgroup index was down 2.5 percent and was lower than April 1963 by 7.7 percent. Lower prices for western frozen halibut (down 7.2 percent) at New York City were largely responsible for the decline, together with sharply lower prices for Great Lakes fresh-water fish. Although certain North Pacific halibut fishing areas were open in April, the main areas did not open until May 1. Since stocks were liberal, frozen halibut prices dropped in April. The declines were offset, to some extent, by higher April prices at Boston for ex-vessel large haddock (up 9.1 percent) and fresh and frozen king salmon (up 1.8 percent) at New York City. Compared with April 1963, prices this April were lower for all items in the subgroup except fresh large haddock (up 7.8 percent) at Boston and round fresh yellow pike (up 1.2 percent) at New York City.

The subgroup index for processed fresh fish and shellfish in April 1964 was down 0.9 percent from the previous month. Prices this April were lower than in March for fresh haddock fillets (down 3.1 percent) at Boston and fresh shrimp (down 1.6 percent) at New York City. Compared with April 1963, the subgroup index this April was down 9.9 percent mainly because of lower prices for fresh shrimp (down 13.7 percent) as well as for all other items in the subgroup.

All items listed in the subgroup for processed frozen fish and shellfish this April were priced lower than in March and the index was down 1.6 percent. The more significant price



| Wholesale Average Prices and Indexes for Edible Fish and Shellfish, April 1964 with Comparisons | | | | | | | | |
|--|------------------|------|--------------------------------|-----------|-----------------------|-----------|-----------|-----------|
| Group, Subgroup, and Item Specification | Point of Pricing | Unit | Avg. Prices ^{1/} (\$) | | Indexes (1957-59=100) | | | |
| | | | Apr. 1964 | Mar. 1964 | Apr. 1964 | Mar. 1964 | Feb. 1964 | Apr. 1963 |
| ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) | | | | | 103.1 | 104.1 | 109.0 | 113.6 |
| Fresh & Frozen Fishery Products: | | | | | 103.7 | 105.5 | 113.2 | 117.7 |
| Drawn, Dressed, or Whole Finfish: | | | | | 98.4 | 100.9 | 120.3 | 106.6 |
| Haddock, lge., offshore, drawn, fresh | Boston | lb. | .09 | .08 | 67.4 | 61.8 | 160.2 | 62.5 |
| Halibut, West., 20/80 lbs., drsd., fresh or froz. | New York | lb. | .28 | .30 | 82.3 | 89.2 | 90.2 | 118.3 |
| Salmon, King, lge. & med., drsd., fresh or froz. | New York | lb. | .83 | .82 | 116.3 | 114.2 | 116.0 | 122.3 |
| Whitefish, L. Superior, drawn, fresh. | Chicago | lb. | .57 | .73 | 84.3 | 108.2 | 85.8 | 104.5 |
| Yellow pike, L. Michigan & Huron, rnd., fresh | New York | lb. | .43 | .70 | 69.6 | 114.7 | 101.6 | 68.8 |
| Processed, Fresh (Fish & Shellfish): | | | | | 115.0 | 116.1 | 114.0 | 127.7 |
| Fillets, haddock, sml., skins on, 20-lb. tins | Boston | lb. | .31 | .32 | 75.3 | 77.7 | 140.8 | 76.5 |
| Shrimp, lge. (26-30 count), headless, fresh | New York | lb. | .95 | .97 | 111.3 | 113.1 | 106.6 | 128.9 |
| Oysters, shucked, standards | Norfolk | gal. | 7.50 | 7.50 | 126.5 | 126.5 | 118.0 | 134.9 |
| Processed, Frozen (Fish & Shellfish): | | | | | 94.7 | 96.2 | 100.7 | 114.4 |
| Fillets, Flounder, skinless, 1-lb. pkg. | Boston | lb. | .37 | .39 | 93.8 | 98.9 | 98.9 | 97.6 |
| Haddock, sml., skins on, 1-lb. pkg. | Boston | lb. | .37 | .37 | 107.0 | 108.5 | 115.8 | 99.7 |
| Ocean perch, lge., skins on 1-lb. pkg. | Boston | lb. | .31 | .33 | 108.7 | 114.0 | 114.0 | 117.5 |
| Shrimp, lge. (26-30 count), brown, 5-lb. pkg. | Chicago | lb. | .73 | .74 | 86.6 | 87.2 | 91.3 | 122.8 |
| Canned Fishery Products: | | | | | 102.5 | 102.2 | 102.0 | 106.8 |
| Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. | Seattle | cs. | 22.00 | 21.75 | 95.9 | 94.8 | 94.8 | 105.7 |
| Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. | Los Angeles | cs. | 11.63 | 11.63 | 103.3 | 103.3 | 103.3 | 104.4 |
| Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs. | Los Angeles | cs. | 6.13 | 6.13 | 103.9 | 103.9 | 103.9 | 2/100.0 |
| Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. | New York | cs. | 9.09 | 9.21 | 116.5 | 118.2 | 116.5 | 116.2 |
| ^{1/} Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices. ^{2/} Replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics. | | | | | | | | |

declines were for ocean perch fillets (down 5.3 percent) and flounder fillets (down 5.2 percent); frozen shrimp prices were down 0.7 percent from the previous month. Frozen shrimp prices this April were 29.5 percent lower than in the same month a year earlier. While prices in this subgroup were lower than in April 1963 for nearly all items, the marked price drop for frozen shrimp contributed to a larger degree than the other items toward a 17.2-percent drop in the April 1964 subgroup index as compared with the same month in 1963.

Despite reports of liberal canned pink salmon stocks, increased demand caused April 1964 prices to move up slightly (up 1.2 percent) from the previous month, but they were still 9.3 percent lower than in April 1963. That price increase was offset by somewhat lower prices for canned Maine sardines (down 1.4 percent) prior to the start of the new sardine canning season. The subgroup index for canned fishery products was down 0.3 percent from March to April and was lower by 4.0 percent as compared with April 1963.



Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.



International

NORTHWEST PACIFIC FISHERIES COMMISSION

PROGRESS ON EIGHTH ANNUAL JAPAN-U.S.S.R. CONFERENCE:

On April 3, 1964, Japan and the Soviet Union reached agreement at Moscow on the 1964 king crab production quota for the Okhotsk Sea. As in 1963, the quota was set at 630,000 cases (48 6.5-oz. cans). The Soviet Union's share is 378,000 cases; Japan's 252,000 cases. Two seasons were established, April 15-May 25 and August 5-25. The closing date in August was shortened by five days from 1963. Area and gear restrictions are the same as last year.

Japan will again operate the four king crab factoryships Hakuyo Maru (6,372 gross tons), Yoko Maru (9,800 gross tons), Kaiyo Maru (5,449 gross tons), and Seiyo Maru (6,404 gross tons). The four factoryships, each accompanied by four catcher vessels and carrying 10 Kawasaki portable launches, were scheduled to leave Hakodate April 7-8 for the Okhotsk Sea.

On April 6 Japan and the Soviet Union entered into discussions of the 1964 salmon catch quotas and regulatory measures for the salmon fishery. Items on the agenda remaining to be settled during the annual meeting were: (1) determination of a salmon catch quota for a 2-year period; (2) establishment of the 1964 catch quota; (3) intensification of regulatory enforcement in Area B; and (4) regulation of the pink and red salmon fisheries.

With regard to agenda item 1, the Soviet Union, although having agreed to discuss this matter provided that it would be limited to the catch for Area B, was taking the position that it would be impossible to determine a catch quota for a two-year period. Japan, on the other hand, wanted to open discussions on this subject.

As for agenda items 2-4, the Soviet Union was pressing for a reduction in catch quotas for red salmon in Area A (Pacific Ocean north of 45° N. latitude) and for pink salmon in Area B (Pacific Ocean south of 45° N. latitude). The Russians based their analysis on the condition of pink salmon stocks in the treaty area on the basis of 1962 resource data. They are also asserting that in Area B enforcement should be strengthened in view of the great numbers of Japanese fishing vessels taking salmon in that area. (Note: U.S.S.R. claims over 2,000 Japanese fishing vessels operating in Area B.) In addition to placing Russian observers on Japanese patrol vessels, the Soviet Union wanted to station inspectors at Japanese fishing ports to observe the unloading of salmon catches taken from Area B.

Japan, on the other hand, was said to be seeking to develop the discussions on the condition of pink salmon stocks on the basis of resource conditions that prevailed in 1963, when pink salmon runs were relatively good. On the matter of enforcement in Area B, Japan contends that the Soviet proposal not only violates the agreement concluded in 1962 between the then Minister of Agriculture and Forestry and the Soviet Fisheries Minister--that Areas A and B would be patrolled under separate systems--but would result in infringing on Japan's sovereignty over her territory. Japan was also claiming that the patrol system as applied in Area A would be difficult to adopt for Area B, since numerous small oper-

ators of 2- to 3-ton vessels predominate in that fishery. Moreover, a more rigid application of enforcement measures would run counter to national sentiment. (Suisan Keizai Shimbun April 3, 5, & 7; Suisan Tsushin, April 7, 1964.)

NORTH PACIFIC FUR SEAL CONVENTION

SOVIET UNION RATIFIES PROTOCOL AMENDING INTERIM CONVENTION:

On March 12, 1964, the Union of Soviet Socialist Republics deposited ratification of the Protocol amending the interim convention of February 7, 1957, on conservation of North Pacific fur seals. The Protocol, which was done at Washington, D. C., October 8, 1963, was not in force at the time of Soviet ratification. (Bulletin, U. S. Department of State, March 30, 1964.)

Note: See Commercial Fisheries Review, December 1963 p. 52.

INTERNATIONAL CONVENTION FOR THE NORTHWEST ATLANTIC FISHERIES

ICELAND RATIFIES PROTOCOL AMENDMENT CONCERNING HARP AND HOOD SEALS:

On March 23, 1964, Iceland deposited ratification of a Protocol to the International Convention for the Northwest Atlantic Fisheries. The Protocol (done at Washington July 15, 1963), relates to harp and hood seals and is intended to bring those species within the responsibility of the Northwest Atlantic Fisheries Commission. The Protocol is not in force. (Bulletin, U. S. Department of State, April 13, 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 45.

FISH MEAL

PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY 1964:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Angola, Iceland, Norway, Peru, South Africa/South-West Africa, and Chile. Although total production of fish meal in FEO countries in January 1964 was up substantially from January 1963, their exports declined in the first month of 1964. The decline was due to a drop in Peruvian shipments.

In January 1964, Peru accounted for 59.8 percent of total fish-meal exports by FEO countries, followed by Norway with

International (Contd.):

Production and Exports of Fish Meal by Member Countries of the FEO, January 1964

| Country | Production January | | Exports January | |
|-----------------------------------|-------------------------------|-------|--------------------|-------|
| | 1964 | 1963 | 1964 | 1963 |
| |(1,000 Metric Tons)..... | | | |
| Angola | 5.6 | 2.6 | 4.8 | 2.9 |
| Iceland | 5.7 | 9.5 | 11.5 | 9.1 |
| Norway | 8.6 | 3.7 | 27.2 | 8.2 |
| Peru | 195.6 | 145.6 | 102.0 | 147.2 |
| So. Africa (incl. S.W. Africa) .. | 14.0 | 9.8 | 13.4 | 6.8 |
| Chile | 21.8 | 1/ | 11.8 | 1/ |
| Total | 251.3 | 171.2 | 170.7 | 174.2 |

1/ Data not available. Chile became a member of FEO at the end of 1963.

15.9 percent, South Africa with 7.9 percent, Chile with 6.9 percent, Iceland with 6.7 percent, and Angola with 2.8 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, April 1, 1964.)

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WORLD PRODUCTION, JANUARY 1964 AND JANUARY-DECEMBER 1963:

World fish meal production in January 1964 was substantially above that in the same month of the previous year. Peruvian output was up 34.2 percent, and production was up in most other producing countries, with the exception of Canada, Iceland, and the United States.

Production during January-December 1963 was similar to that in the previous year. A decline in production in the United States and Iceland was offset by greater output in Denmark, Norway, Peru, and South Africa. Peru accounted for 49.5 percent of total fish meal production in 1963, fol-

World Fish Meal Production by Countries, January 1964 and January-December 1963

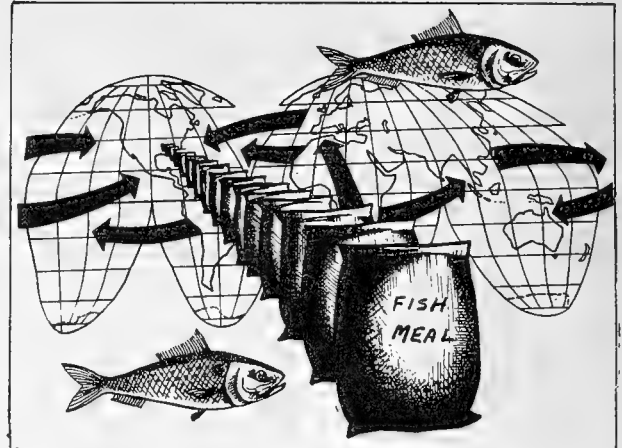
| Country | January | | Jan.-Dec. | |
|---------------------------|-------------------------|---------|-----------|-----------|
| | 1964 | 1963 | 1963 | 1962 |
| |(Metric Tons)..... | | | |
| Canada | 3,405 | 7,516 | 77,436 | 79,371 |
| Denmark | 8,799 | 6,118 | 100,001 | 91,110 |
| France | 1,100 | 1,100 | 13,200 | 13,200 |
| German Federal Rep. .. | 6,757 | 5,975 | 73,997 | 72,442 |
| Netherlands | 1/ | 2/ 300 | 6,700 | 2/ 4,900 |
| Spain | 1/ | 2,085 | 3/17,022 | 25,499 |
| Sweden | 1,070 | 444 | 6,636 | 5,000 |
| United Kingdom | 7,736 | 6,443 | 75,290 | 74,184 |
| United States | 1,667 | 2,072 | 2/208,289 | 2/270,661 |
| Angola | 5,566 | 2,956 | 31,829 | 32,767 |
| Iceland | 5,736 | 9,476 | 87,730 | 96,147 |
| Norway | 8,607 | 3,659 | 131,546 | 120,924 |
| Peru | 195,551 | 145,659 | 1,159,233 | 1,121,096 |
| So. Afr. (incl. SW. Afr.) | 14,302 | 10,522 | 238,269 | 201,604 |
| Belgium | 375 | 375 | 4,500 | 1/ |
| Chile | 21,848 | 1/ | 90,411 | 1/ |
| Morocco | 1/ | 1/ | 19,000 | 1/ |
| Total | 282,519 | 204,700 | 2,341,089 | 2,208,905 |

1/ Data not available.

2/ Revised.

3/ Data available only for January-October.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present. Belgium, Chile, and Morocco did not report production prior to 1963.



lowed by South Africa with 10.2 percent, and the United States with 8.9 percent.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

Australia

TUNA FISHERY TRENDS, 1963-64:

The Australian live bait and pole fishing season for bluefin tuna off New South Wales ended January 28, 1964, with a record catch of 2,915 metric tons. Long-lining and trolling for yellowfin tuna off New South Wales was continued by 12 vessels after the closure of the New South Wales bait-and-pole fishery for bluefin.

The first big run of bluefin tuna was located off Green Cape on December 3, 1963, by spotter aircraft. The use of airborne scouts contributed greatly to the good catches. The success of the New South Wales season raised the question of whether the tuna will be available in the future and whether the schools can be followed as far as Tasmania.

A catch of 1,000 tons of bluefin tuna had been taken by mid-February 1964 off the State of South Australia where the season extends later than in New South Wales. The bluefin catch target during the South Australian season is 4,000 tons. (Australian Fisheries Newsletter, March 1964.)

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COMMON NAMES FOR SHRIMP:

The Australian Commonwealth-States Fisheries Conference has adopted uniform names for shrimp as follows:

Australia (Contd.):

| Common Name | Scientific Name |
|------------------------------|----------------------------------|
| Tiger prawn | <i>Penaeus esculentus</i> |
| Banana prawn | <i>Penaeus merguensis</i> |
| York prawn | <i>Metapenaeus eboracensis</i> |
| Endeavor prawn | <i>Metapenaeus endeavouri</i> |
| School prawn | <i>Metapenaeus macleayi</i> |
| Green-tail prawn | <i>Metapenaeus mastersii</i> |
| Rainbow prawn | <i>Parapenaeopsis sculptilis</i> |
| Eastern king prawn | <i>Penaeus plebejus</i> |
| Western king prawn | <i>Penaeus latisulcatus</i> |

In addition, the Conference has given the crab (*Portunus pelagicus*) the uniform common name of sand crab. (Australian Fisheries Newsletter, March 1964.)



Brazil

JAPANESE-BRAZILIAN JOINT WHALING ENTERPRISE TO CONTINUE OPERATIONS:

The Japanese firm which is partner to the joint Japanese-Brazilian whaling enterprise located at Cabedelo, nearby Joao Pessoa, Brazil, plans to continue its operations at that base. Reportedly, the joint enterprise showed a profit for the first time last year. Demand for whale meat in the region supplied by that firm is good. On the other hand, another Japanese fishing company is planning to terminate this year its whaling operations located at Cabo Frio, Brazil, due to a depressed local market for whale meat. (Suisan Tsushin, March 24, 1964.)



Canada

NEW BRUNSWICK FISHERIES TRENDS, 1963:

Fishing Fleet: The modernization of the New Brunswick fishing fleet continued at an accelerated rate in 1963, when 7 new steel stern trawlers and 2 large wooden trawlers were built in New Brunswick shipyards at a total cost of C\$3,450,000 (US\$320,000). Those, together with many new smaller in-shore vessels, contributed to the 15-percent increase in the annual New Brunswick catch, making 1963 a record year in total fish landings for the Province.

Tuna Industry: The New Brunswick Fishermen's Loan Board is participating in a plan to establish a commercial tuna fishery in the Province. The Board has helped provide 2 well-equipped steel purse-seine vessels on a cooperative basis for 2 groups of Campobello Island fishermen at a cost of C\$300,000 (US\$278,000) each. Both vessels were built in Bathurst, New Brunswick, under a Federal cost-sharing program. One of the vessels arrived at Campobello Island in September 1964 with about 90 metric tons of skipjack tuna, the first commercial tuna ever landed by Canadians on the eastern seaboard. It is understood that the vessels made other good catches. Most of the tuna was unloaded at Campobello and trucked to a packing plant in Eastport, Maine, for processing. Some, however, found its way to the local New Brunswick market in fresh form, although it was not well accepted by local consumers.

Shore Facilities: No important changes or significant developments in the shore-based establishments of the New Brunswick fisheries industry were apparent during 1963.

School of Fisheries: The Province's first school designed to advance the technical and scientific knowledge of Provincial fishermen was established at Caraquet, New Brunswick, in 1963. The new school offers instruction in navigation, fisheries, economics, oceanography, and the operation of electronic navigational equipment and fishing aids. The school features a three-year course; however, each year's term runs only from the first of December until the end of April. There was an initial registration of about 40 students and they ranged in age between 18 and 35 years.

Fisheries Department Established: A new Department of Fisheries was created by the Government of New Brunswick during 1963 to better meet the requirements of industry and the challenges of modern technology. Matters pertaining to the fisheries industry formerly were administered by the Fisheries Branch, operating under the Department of Industry and Development of the Provincial Government. (United States Consulate, Saint John, March 18, 1964.)

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BRITISH COLUMBIA HERRING LANDINGS AND PRODUCTS, 1963/64:

| Season Ending | Unit | March 28, 1964 | March 10, 1963 | March 10, 1962 | March 18, 1961 ^{1/} | March 12, 1960 ^{1/} | March 14, 1959 |
|---------------------------|-------|----------------|----------------|----------------|------------------------------|------------------------------|----------------|
| Landings: | | | | | | | |
| District No. 2: | | | | | | | |
| Northern . . . | Tons | 35,016 | 42,792 | 33,254 | 47,088 | 23,239 | 10,980 |
| Central . . . | " | 56,123 | 62,626 | 39,032 | 43,505 | 10,919 | 40,628 |
| Q. C. Islands . . | " | 32,582 | 19,856 | 16,604 | 2,896 | 3,121 | 23,058 |
| District No. 3: | | | | | | | |
| Lower East Coast | " | 66,216 | 55,665 | 51,821 | 31,309 | 55,582 | 51,648 |
| Middle East Coast | " | 20,347 | 24,707 | 20,561 | 10,023 | 20,014 | 10,183 |
| Upper East Coast | " | 15,513 | 10,697 | 13,294 | 2,978 | 10,005 | 15,015 |
| West Coast . . . | " | 36,248 | 49,304 | 49,595 | 34,142 | 62,273 | 78,122 |
| Total landings | " | 262,045 | 265,647 | 224,161 | 171,941 | 185,153 | 229,634 |
| Products Produced: | | | | | | | |
| Bait | " | 1,128 | 886 | 575 | 1,619 | 848 | 1,046 |
| Meal | " | 46,778 | 48,035 | 39,535 | 31,014 | 34,492 | 42,307 |
| Oil | Imp. | 4,877,688 | 4,771,087 | 4,676,991 | 2,956,948 | 4,585,307 | 4,545,845 |
| | Gals. | | | | | | |

^{1/}Limited operations.

Canada (Contd.):

Herring landings in British Columbia during the 1963/64 season were about the same as in the previous season. Compared with the previous season, fish-meal production in 1963/64 was down 2.6 percent, but fish-oil production was up 2.2 percent.

Note: See Commercial Fisheries Review, May 1962 p. 44.



Ceylon

LOAN REQUESTED FROM JAPAN
TO START TUNA FISHERY:

The Government of Ceylon has approached the Japanese Government for a loan of US\$4 million to establish a tuna fishery. Under the proposal, a tuna base with cold-storage facilities would be constructed in Ceylon and ten 150-ton tuna vessels imported from Japan.

Informed sources claim it is very likely that the Japanese Government would respond favorably to the proposal. The Japanese Fisheries Agency is planning to conduct a feasibility study as soon as further details become available. (Suisancho Nippo, April 9, 1964.)



Chile

NEW REGULATIONS ON FOREIGN
WHALING PERMITS AS JAPANESE
WHALERS BEGIN OPERATIONS
FOR CHILEAN FIRM:

The Chilean Government issued Decree No. 811, dated December 10, 1963, concerning regulations for foreign whalers requesting permission to operate within the 200-mile marine zone claimed by Chile. Decree No. 811, published in Diario Oficial, No. 25730, January 2, 1964, grants the Chilean Ministry of Agriculture authority to issue permits to foreign whalers to hunt for a period of 3 years within the 200-mile zone claimed by Chile. Permits under Decree No. 811 are restricted to foreign vessels working under contract for a processing plant located in Chile. (Chilean Decree No. 130 of February 11, 1959, is the controlling regulation for the issuance of permits to foreign whalers seeking to operate within the 200-

mile zone and to take their catch outside of Chile.) Foreign whaling vessels receiving permits under Decree No. 811 must be constructed of steel and be under 10 years of age. After three years the foreign vessel must be either nationalized or withdrawn.

The issuance of Decree No. 811 may have been related to the contract made by a Chilean whaling company with the 2 Japanese whalers, Seiju Maru and Ryuhō Maru, to work off Chile during a period in January-May 1964. The 2 Japanese whalers received a 4-month permit to hunt off Chile under Chilean Decree No. 1078, however, that decree was designed for foreign vessels desiring to fish for anchoveta. It is understood that the 2 Japanese whalers have sought new permits under Decree No. 811.

In March 1964, a representative of the Chilean company that brought the Japanese whalers to Chile said that the Japanese equipment was excellent, their crews were experienced, and operations had been very successful. (United States Embassy, Santiago, March 18, 1964.)

Note: See Commercial Fisheries Review, June 1963 p. 68.

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SONAR EXPERT ASSIGNED TO
FISHERIES DEVELOPMENT INSTITUTE:

On March 10, 1964, the Food and Agriculture Organization (FAO) announced the assignment of a Norwegian fisheries acoustics expert to the Fisheries Development Institute of Chile for 2 years. The Institute is a project of the United Nations Special Fund, for which FAO is the executing agency. Launched in November 1963, the Institute is working to provide Chile with a permanent technological base for the rapid development of fisheries resources.

The acoustics specialist is the fifth FAO expert to be assigned to the Institute. His principal job will be to help determine, through sonar sweepings or readings, the distribution and abundance of fish stocks in Chilean waters. Plans called for him to begin sonar investigations in late May or early June 1964 of the anchoveta schools off the northern coast of Chile. In the past, Chilean fishermen have taken anchoveta only within narrow limits and always within sight of the coast. The possibility of extending the range of Chilean fishermen will be explored by the Norwegian expert. He will also train Chilean fishermen in the proper use of com-

Chile (Contd.):

plicated sonar equipment. (Food and Agriculture Organization of the United Nations, Rome, March 10, 1964.)

Note: See Commercial Fisheries Review, November 1963 p. 58.



Colombia

FISHING INDUSTRY LOSES FISHING VESSELS:

Colombia is losing the Panamanian, Costa Rican, and United States vessels which had supplied the developing fishing industry of Buenaventura, a Pacific port in northern Colombia. The vessels are leaving as a result of the National Government's recent enforcement of Colombian Decreto Numero 1409 of July 31, 1958, requiring foreign-flag vessels operating in Colombian waters to nationalize 25 percent of their ownership annually, according to an April 7, 1964, report.

Two Colombian fish-processing plants have already shut down and two others are threatening to close because of a shortage of fish and shrimp. As a result, 500 fish-plant workers are unemployed and the number may increase.

One Colombian fish-processing company has several fishing vessels under construction in the United States, but the first vessel was not to be delivered until late April 1964. Other firms have been unable to finance the purchase or construction of new fishing vessels to supplement the limited Colombian fishing fleet.



Communist China

AQUATIC PRODUCTS SOCIETY FOUNDED:

A Communist Chinese Aquatic Products Society has been established, according to "NCNA-English," Peking, December 28, 1963. The Society was said to have held its first national meeting in late 1963. Communist Chinese fishery technicians attending the meeting are reported to have claimed that encouraging results had been obtained in (1) the artificial breeding of fresh-water fish such as "big head" and carp; (2) extending edible seaweed toward the south; (3) survey-

ing fishery resources and major fishing grounds; and (4) improving fishing gear, motor vessels and junks, and processing. It was stated that Communist China has 23 research institutions and a total of 17 colleges and secondary schools which conduct aquatic studies and fisheries training. (Newsletter, February 29, 1964, National Oceanographic Data Center.)



Denmark

FISHERY EXPORTS TO THE UNITED STATES, 1963:

Danish total exports of fishery products and byproducts to the United States in 1963 dropped 10 percent in value from those in 1962, although the total quantity was about the same in both years. Larger shipments of frozen fillets were offset by a decline in the exports of frozen pond trout, frozen lobster, and canned brisling and herring. Pond trout exports declined because of more profitable prices in European markets. Lob-

| Product | 1963 | | | 1962 | | |
|---------------------------------|------------------|-----------------|------------------|------------------|-----------------|------------------|
| | Qty. Metric Tons | Value 1,000 Kr. | Value US\$ 1,000 | Qty. Metric Tons | Value 1,000 Kr. | Value US\$ 1,000 |
| Fresh and Frozen: | | | | | | |
| Pond trout, | 784.0 | 6,103 | 885 | 969.0 | 7,377 | 1,070 |
| Other trout & salmon, | 0.2 | 11 | 2 | 58.0 | 525 | 76 |
| Trout eggs, | 0.8 | 67 | 10 | 1.0 | 84 | 12 |
| Flatfish, | 130.0 | 726 | 105 | 226.0 | 1,666 | 242 |
| Fillets: | | | | | | |
| Flatfish, | 141.0 | 539 | 78 | 23.0 | 119 | 17 |
| Cod, | 8,935.0 | 27,918 | 4,048 | 7,903.0 | 24,506 | 3,553 |
| Other, | 628.0 | 744 | 108 | 612.0 | 2,157 | 312 |
| Lobster, Deep-water, | 212.0 | 4,368 | 633 | 308.0 | 6,562 | 952 |
| Other, | 11.0 | 69 | 10 | 14.0 | 126 | 18 |
| Processed: | | | | | | |
| Salted, | 104.0 | 187 | 27 | 122.0 | 242 | 35 |
| Smoked, | 0.6 | 20 | 3 | 1.0 | 34 | 5 |
| Canned: | | | | | | |
| Brisling and herring, | 556.0 | 2,977 | 432 | 1,569.0 | 6,249 | 906 |
| Shrimp, | 175.0 | 1,654 | 240 | 209.0 | 1,717 | 249 |
| Mussels, | 57.0 | 350 | 51 | 24.0 | 154 | 22 |
| Other, | 40.0 | 222 | 32 | 31.0 | 152 | 22 |
| Semipreserved: | | | | | | |
| Caviar, | 17.0 | 196 | 28 | 16.0 | 179 | 26 |
| Other, | 3.0 | 44 | 6 | 1.0 | 3 | 2/ |
| Fish solubles, | 400.0 | 344 | 50 | 100.0 | 80 | 12 |
| Total, | 12,194.6 | 46,539 | 6,748 | 12,187.0 | 51,932 | 7,529 |

^{1/}Includes direct shipments from Greenland.
^{2/}Less than \$1,000.
 Source: Preliminary data from Ministry of Fisheries.
 Note: One Danish kroner equals US\$0.145.

ster exports dropped with lower market prices in 1963. Exporters of canned brisling and herring found the United States market less profitable with the Maine canned sardine pack again at normal levels. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 25, 1964.)

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FISHERIES TRENDS, MARCH 1964:

Joint Nordic Fisheries Limits Considered: Representatives of the Danish, Norwegian, and Swedish Fisheries Ministries met in late March 1964 to consider the implications

Denmark (Contd.):

of the agreement on fisheries limits reached at the recent Western European Fisheries Conference in London. The officials also discussed the possibility of establishing joint Nordic fisheries limits.

Danish Fisheries Council May Dissolve: At a meeting in Copenhagen on March 18, 1964, the 10 fisheries associations represented on the Danish Fishery Council could not agree on a substantial increase in the membership fee nor on the market promotion activities to be conducted in the future. The Council, which has served as a single point of contact between the fisheries associations and Government authorities, will dissolve on April 1, 1965, unless there is a change in the view of the flatfish fillet association, the single dissenter from the majority opinion on the Council.

Danish Promotion of Fish Marketing in the United States: Marketing of Danish fish in the United States will be aided by a contribution from the Danish Ministry of Fisheries, which has decided to contribute to the Fish 'n Seafood promotion of the United States fishery organizations. The amount of the Danish contribution will be determined by taking the 3-year average of exports of frozen groundfish fillets to the United States from Denmark, including Greenland, which represents about 7 percent of the total United States imports of groundfish fillets. The Danish Ministry of Fisheries hopes that the Danish fishing industry will continue the contribution in future years.

A Danish Fish Week at the New York World's Fair this year is still in the planning stage.

The Danish Fisheries Ministry is seeking applicants for the position of Danish fisheries attache in New York City. The attache's responsibilities will include Canada as well as the United States.

Low Industrial Fish Landings Stimulate Price Increase: After a promising start in early 1964, Danish landings of industrial fish have declined. Fish meal and oil plants have increased ex-vessel industrial fish prices from \$22.36 to \$26.31 per short ton with the expectation of attracting some of the vessels which had shifted to catching food fish. At least half of Esbjerg's 500 or more cutters normally fish for industrial fish, but about 150 had shifted to fishing for plaice and other food fish.

Frozen Food Outlets May Triple: The number of stores which can sell deep-frozen foods in Denmark will be tripled after January 1, 1966, if legislation proposed by the Interior Ministry is adopted. By giving cooperatives and grocery stores the same rights to dispense deep-frozen foods as butchers and delicatessens now have, the proposed legislation would add 13,578 grocery stores and 2,312 cooperatives to the present 5,543 frozen food outlets. Sale of frozen foods also would be permitted in automatic vending machines. Frozen food packages would have to carry a date stamp and be inspected by health authorities.

Fisheries Legislation Revisions Proposed: Four proposals for legislation governing the salt-water fisheries, the eel fisheries, the fresh-water fisheries, and fisheries in two of the Danish fjords have been submitted to the Danish Parliament by the Fisheries Minister. Revisions in the salt-water fisheries legislation are designed to bring regulations into accord with modern fishery requirements and are in substantial agreement with the recommendations of a committee composed mainly of industry representatives. One new proposal would forbid certain changes which would adversely affect the fisheries. Another proposal would make it possible for the fishing industry to seek damages when other activities in fishing areas affect the industry. A three-man committee would seek a solution in those cases where the fishing industry must give way to more important industrial, agricultural, or other interests.

Early approval of the legislation is not expected because of the elections due in the fall and the unsettled question of Danish fisheries limits.

Fishery Cooperatives Enjoy Good Year: Danish fishery cooperatives had a good year in 1963 with total sales of Kr. 130 million (US\$18.8 million), or 10 percent more than in 1962. There are 34 cooperatives with about 1,800 members. The local marketing cooperatives accounted for Kr. 50 million (\$7.2 million) of the total; the 2 fish reduction plants for Kr. 63 million (\$9.1 million) and the national association of fish marketing cooperatives, Dansk Andelsfisk, for Kr. 17 million (\$2.5 million). The cooperatives handle about 20-25 percent of the Danish fisheries catch, including about 15 percent of the food fish and about 35 percent of the industrial fish landings. Dansk Andelsfisk has just announced plans for the construction of a freezer and warehouse in Copenhagen to be completed in the spring of 1965. It will pack and freeze fillets from local plants as well as some shipped in from the filleting operation on the Island of Bornholm. The cooperative association ships substantial quantities of fish blocks to the United States. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 25, 1964.)

Note: Danish kroner 6,904 equals US\$1.00.



Greece

FISHERY LANDINGS, 1962-1963:

Greek fishery landings in 1963 were up 17.3 percent from those in previous year, due mainly to heavier landings by near- and middle-water trawlers and purse seiners. Total Greek landings were valued at DR.979 million

| Greek Fishery Landings by Fishing Areas, 1962-1963 | | |
|---|-----------------------|--------|
| Fishing Area | 1963 | 1962 |
| | ... (Metric Tons) ... | |
| Atlantic | 18,600 | 17,000 |
| Mediterranean | 9,200 | 10,000 |
| Middle and near-water (trawlers and purse seiners) | 60,000 | 48,000 |
| Inshore | 9,400 | 8,000 |
| Lagoons and lakes | 6,000 | 5,000 |
| Total landings | 103,200 | 88,000 |

(US\$32.6 million) in 1963 and Dr.869 million (\$29.0 million) in 1962. (Alieia, January 1964.)

Notes: (1) Greek drachmas 30.0 equal US\$1.00.

(2) See Commercial Fisheries Review, April 1963 p. 52.



Guatemala

SHRIMP CATCH, 1962-1963:

The Guatemalan Ministry of Agriculture has reported that in 1963 a total of 1,990,149 pounds of shrimp were landed in Guatemala by a fishing fleet of 30 vessels, compared with shrimp landings of 2,207,203 pounds by a fleet of 49 vessels in 1962. (United States Embassy, Guatemala, March 20, 1964.)



Iceland

FISHERY EXPORTS TO THE SOVIET BLOC, 1963:

Iceland's trade with the Soviet Bloc has declined about 50 percent from the peak levels of the late 1950's. The Bloc's share of total Icelandic exports was 17.3 percent in 1963; 18.5 percent in 1962; 14.2 percent in 1961; 23.1 percent in 1960; and 33.7 percent in 1959. Fishery products accounted for about 96.3 percent of the value of Icelandic shipments to the Bloc in 1963.

Frozen and salted herring and frozen fish fillets made up the bulk of Icelandic exports to the Bloc. In 1963, the Bloc bought 67 percent of Iceland's frozen herring exports and 34 percent of Iceland's salted herring exports.

| Icelandic Fishery Exports to the Soviet Bloc, 1963 | | | |
|--|------------------|----------------|---------------|
| Country of Destination and Commodity | Quantity | F.O.B. Value | |
| | | Metric Tons | IKr. 1,000 |
| Czechoslovakia: | | | |
| Frozen herring | 3,218.9 | 19,582 | 456 |
| Frozen fish fillets | 1,139.4 | 19,176 | 446 |
| Canned or preserved fish | 108.4 | 3,235 | 76 |
| Cod-liver oil | 500.0 | 4,887 | 114 |
| Herring meal | 2,884.8 | 16,422 | 382 |
| Herring oil | 206.1 | 1,141 | 27 |
| Total | 8,056.7 | 64,443 | 1,501 |
| East Germany: | | | |
| Frozen herring | 3,790.2 | 24,358 | 567 |
| Other frozen fish | 102.2 | 964 | 22 |
| Salted herring | 1,863.5 | 17,015 | 396 |
| Total | 5,755.9 | 42,337 | 985 |
| Bulgaria: | | | |
| Cod-liver oil | 190.0 | 1,529 | 36 |
| Hungary: | | | |
| Frozen fish fillets | 75.0 | 1,311 | 31 |
| Canned or preserved fish | 0.5 | 40 | 1 |
| Fish meal | 520.1 | 3,285 | 76 |
| Total | 595.6 | 4,636 | 108 |
| Poland: | | | |
| Frozen herring | 1,500.0 | 8,940 | 208 |
| Cod-liver oil | 370.0 | 3,706 | 86 |
| Salted herring | 3,000.0 | 26,253 | 611 |
| Herring meal | 5,643.0 | 35,156 | 819 |
| Total | 10,513.0 | 74,055 | 1,724 |
| Rumania: | | | |
| Frozen herring | 3,952.3 | 23,616 | 550 |
| Salted herring | 2,592.6 | 20,355 | 474 |
| Cod-liver oil | 155.0 | 1,140 | 26 |
| Total | 6,699.9 | 45,111 | 1,050 |
| U.S.S.R.: | | | |
| Frozen herring | 12,003.8 | 63,439 | 1,477 |
| Frozen fish fillets | 15,411.5 | 248,622 | 5,789 |
| Salted herring | 16,622.7 | 125,088 | 2,912 |
| Canned and preserved fish | 146.0 | 6,764 | 157 |
| Total | 44,184.0 | 443,913 | 10,335 |
| Grand total | 759,951.0 | 676,024 | 15,739 |

Note: Icelandic kronur 42.95 equals US\$1.00.

The Soviet Union was Iceland's most important trade partner in the Bloc, followed by

Poland and Czechoslovakia. No marked change in trade between Iceland and the Soviet Union is expected in the near future since the current trade protocol between the two countries will remain in effect until December 19, 1965. Some of the other trade partners in the Bloc can expect a continual trade decline with Iceland.

Note: See Commercial Fisheries Review, July 1963 p. 76.

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UTILIZATION OF FISHERY LANDINGS:

| How Utilized | January-October | |
|--------------------------------------|---------------------------|----------------|
| | 1963 | 1962 |
| | . . . (Metric Tons) . . . | |
| Herring^{1/} for: | | |
| Canning | 296 | 335 |
| Oil and meal | 267,338 | 330,953 |
| Freezing | 26,342 | 18,194 |
| Salting | 71,240 | 55,515 |
| Fresh on ice | 5,617 | 7,718 |
| Groundfish^{2/} for: | | |
| Fresh on ice | 29,663 | 25,970 |
| Freezing and filleting | 155,955 | 151,932 |
| Salting | 69,662 | 85,922 |
| Stockfish (dried unsalted) | 68,530 | 41,668 |
| Canning | 35 | - |
| Home consumption | 12,221 | 11,006 |
| Oil and meal | 3,186 | 3,327 |
| Capelin for: | | |
| Freezing | 188 | - |
| Oil and meal | 889 | - |
| Shrimp for: | | |
| Freezing | 399 | 263 |
| Canning | 113 | 86 |
| Lobsters for: | | |
| Fresh on ice | 2 | - |
| Freezing | 4,872 | 2,335 |
| Total production | 716,548 | 735,224 |
| 1/Whole fish. | 2/Drawn fish. | |

* * * * *

| Species | January-September | |
|--------------------------------------|---------------------------------|----------------|
| | 1963 | 1962 |
| | (Metric Tons) | |
| Herring^{1/} for: | | |
| Oil and meal | 264,388 | 330,953 |
| Freezing | 22,285 | 18,194 |
| Salting | 70,012 | 55,515 |
| Fresh on ice | 5,617 | 7,718 |
| Canning | 296 | 335 |
| Groundfish^{2/} for: | | |
| Fresh on ice | 24,796 | 19,998 |
| Freezing and filleting | 147,604 | 143,906 |
| Salting | 69,109 | 85,108 |
| Stockfish (dried unsalted) | 67,685 | 40,474 |
| Canning | 35 | - |
| Home consumption | 11,167 | 10,040 |
| Oil and meal | 2,977 | 3,139 |
| Capelin for: | | |
| Freezing | 188 | - |
| Oil and meal | 889 | - |
| Shrimp for: | | |
| Freezing | 267 | 263 |
| Canning | 82 | 86 |
| Lobsters for: | | |
| Fresh on ice | 2 | - |
| Freezing | 4,804 | 2,314 |
| Total production | 692,203 | 718,043 |
| 1/Whole fish. | 2/Drawn fish. | |

* * * * *

Iceland (Contd.):

FISHERY LANDINGS BY
PRINCIPAL SPECIES:

| Species | January-October | |
|-----------------------------|---------------------------|---------|
| | 1963 | 1962 |
| | . . . (Metric Tons) . . . | |
| Cod | 218,655 | 212,017 |
| Haddock | 42,470 | 42,196 |
| Saithe | 13,117 | 11,958 |
| Ling | 5,035 | 6,291 |
| Wolfish (catfish) | 16,952 | 13,166 |
| Cusk | 5,179 | 4,446 |
| Ocean perch | 29,911 | 19,187 |
| Halibut | 1,025 | 1,348 |
| Herring | 370,832 | 412,715 |
| Shrimp | 512 | 349 |
| Capelin | 1,077 | - |
| Lobster | 4,874 | 2,335 |
| Other | 6,909 | 9,216 |
| Total | 716,548 | 735,224 |

Note: Except for herring which are landed round, all fish are drawn weight.

* * * * *

| Species | January-September | |
|-----------------------------|---------------------------|---------|
| | 1963 | 1962 |
| | . . . (Metric Tons) . . . | |
| Cod | 214,701 | 207,149 |
| Haddock | 38,738 | 36,205 |
| Saithe | 11,946 | 10,887 |
| Ling | 4,804 | 5,947 |
| Wolfish (catfish) | 12,839 | 12,838 |
| Cusk | 5,013 | 4,201 |
| Ocean perch | 28,059 | 16,015 |
| Halibut | 914 | 1,216 |
| Herring | 362,597 | 412,715 |
| Shrimp | 349 | 349 |
| Capelin | 1,077 | - |
| Other | 11,166 | 10,521 |
| Total | 692,203 | 718,043 |

Note: Except for herring which are landed round, all fish are drawn weight.



Israel

FISHERIES DEVELOPMENT:

An Israeli fishing company wishes to buy, with Israeli governmental assistance, a trawler valued at 2.5 million francs (US\$510,000) which will be able to process and carry 150 metric tons of fish. The company has operated in the Red Sea and intends to expand its activity in that area.

Israeli fish production amounts to about 16,300 tons per year. Fish consumption has been estimated at 6.75 kilos (14.9 pounds) per person per year and officials in the industry hope it will reach 8 kilos (17.6 pounds) per person

per year as in most Mediterranean countries. The Israeli Fisheries Department would like per capita consumption to reach 10 kilos (22.0 pounds) a year. That would require an annual production of 25,000 tons. To fulfill such a quota, 5,000 tons of salt-water fish would be needed. The remainder could be satisfied by fresh-water fish.

In late 1963, the Israeli fishing fleet included a tuna vessel which was fishing in the Indian Ocean, 2 large trawlers and 3 other fishing vessels operating in the Red Sea off Massaouah, 14 trawlers fishing in the Mediterranean Sea and 2 trawlers fishing in the Atlantic, as well as a few hundred smaller vessels fishing in the Mediterranean Sea and Aqaba Gulf.

Israeli Red Sea trawlers, in cooperation with Ethiopia, have launched a research program which has enabled them to explore the Red Sea coast stretching between Assab and Massaouah. (La Peche Maritime, September 1963.)



Japan

FROZEN TUNA EXPORTS:

1963: Japanese exports of frozen tuna to the United States and Canada in 1963 calendar year totaled 82,692 short tons and to other countries (mainly European and African countries) 60,186 metric tons, according to data released by the Japan Frozen Foods Exporters Association. (Suisan Tsushin, March 18, 1964.)

Table 1 - Japanese Exports of Frozen Tuna to United States and Canada, Calendar Years 1962-1963

| Product | 1963 | 1962 |
|---------------------------|-------------------|---------|
| | ..(Short Tons) .. | |
| From Japan Proper: | | |
| Albacore 1/. | 15,655 | 22,594 |
| Skipjack 1/. | 69 | 326 |
| Yellowfin 2/. | 23,419 | 40,930 |
| Big-eyed 2/. | 31 | 398 |
| Bluefin | - | 23 |
| Loins 3/. | 6,238 | 5,143 |
| Subtotal | 45,412 | 69,414 |
| Transshipments: | | |
| Albacore 1/. | 23,127 | 20,049 |
| Skipjack 1/. | 3,693 | 1,081 |
| Yellowfin 2/. | 9,800 | 15,655 |
| Big-eyed 2/. | 285 | 1,327 |
| Bluefin 2/. | 374 | 483 |
| Subtotal | 37,279 | 38,595 |
| Total | 82,691 | 108,009 |

1/Round fish.
2/Includes actual weight of gilled-and-gutted, dressed (with tail), and filleted tuna.
3/Includes mixture of albacore, yellowfin, big-eyed, and bluefin loins.

Japan (Contd.):

Table 2 - Japanese Exports of Frozen Tuna to Countries Other Than the United States and Canada, Calendar Years 1962-1963

| Product | 1963 | 1962 |
|-------------------|---------------------|--------|
| | .. (Metric Tons) .. | |
| Albacore 1/..... | 7,292 | 5,549 |
| Yellowfin 2/..... | 31,603 | 27,411 |
| Big-eyed 2/..... | 11,305 | 9,750 |
| Skipjack 1/..... | 1,735 | 332 |
| Bluefin 2/..... | 8,251 | 3,373 |
| Loin 3/..... | - | 5 |
| Total | 60,186 | 46,420 |

1/Round fish.
2/Includes actual weight of gilled-and-gutted, dressed (with tail), and filleted tuna.
3/Yellowfin tuna.

* * * * *

Fiscal Year 1963: Japanese exports of frozen tuna to the United States and Canada in fiscal year 1963 (April 1963-March 1964) were down 15.8 percent from those in fiscal year 1962 (April 1962-March 1963), according to data compiled by Japan's Frozen Foods Exporters Association. Direct shipments from Japan accounted for 56 percent and transshipments 44 percent of the total. Most of the decline was in exports of yellow-

Table 1 - Japanese Exports of Frozen Tuna to United States and Canada, Fiscal Years 1963/1964 and 1962/1963

| Product | Fiscal Year 1963 | | | FY 1962 Total |
|-------------------|--------------------------|--------------------|--------|------------------|
| | Direct Shipment | Transship- ment | Total | |
| | (Short Tons) | | | |
| Albacore 1/..... | 16,810 | 21,988 | 38,797 | 36,913 |
| Skipjack 1/..... | 12 | 3,719 | 3,731 | 2,452 |
| Yellowfin 2/..... | 23,081 | 10,206 | 33,287 | 51,036 |
| Big-eyed 2/..... | 11 | 149 | 160 | 1,370 |
| Bluefin 2/..... | - | 272 | 272 | 509 |
| Loins 3/..... | 5,996 | - | 5,996 | 5,370 |
| Total | 45,910 | 36,334 | 82,243 | 97,650 |

1/Round fish.
2/Includes actual weight of gilled-and-gutted, dressed (with tail), and filleted tuna.
3/Includes mixture of albacore, yellowfin, big-eyed, and bluefin loins.

Table 2 - Japanese Exports of Frozen Tuna to Other Countries, Fiscal Years 1963/1964 and 1962/1963

| Product | Italy | Fiscal Year 1963 | | | Total |
|---------------|---------------------------|------------------|---------------------|--------------------|--------|
| | | Yugo- slavia | Czecho- slovakia | Other Countries | |
| | (Metric Tons) | | | | |
| Albacore 1/.. | 1,110 | 1,436 | - | 1,873 | 4,419 |
| Skipjack 1/.. | 105 | 347 | 220 | 1,060 | 1,732 |
| Yellowfin 2/ | 26,822 | 5,400 | 83 | 1,461 | 33,766 |
| Big-eyed 2/.. | 6,667 | 1,865 | 1,314 | 1,799 | 11,645 |
| Bluefin 2/.. | 4,871 | 1,837 | 190 | 888 | 7,786 |
| Loins | - | - | - | 12 | 12 |
| Tot, FY 1963 | 39,575 | 10,885 | 1,807 | 7,093 | 59,360 |
| Tot, FY 1962 | 33,049 | 10,288 | 997 | 6,411 | 50,745 |

1/Round fish.
2/Includes actual weight of gilled-and-gutted, dressed (with tail), and filleted tuna.

fin (gilled-and-gutted, dressed, and fillets) which were down 34.8 percent or nearly 18,000 tons below fiscal year 1962. Exports of big-eyed tuna were down sharply and those for bluefin were down to about half the exports of the earlier fiscal year. Exports of round albacore were up 5.0 percent from the previous fiscal year, skipjack was up 52.5 percent, and there was some increase in exports of loins of various tuna species.

Japan's frozen tuna exports to other countries in fiscal year 1963 were up 17.0 percent from the previous year. Exports to Italy were 19.7 percent more than in 1962 with yellowfin accounting for nearly 70 percent of the frozen tuna exports to that country. Exports to Czechoslovakia were nearly double those of the previous year and there was some increase in exports to Yugoslavia and other countries. (Suisan Tsushin, April 8, 1964.)

* * * * *

CANNED TUNA IN OIL EXPORTS:

Japanese exports of canned tuna in oil for April 1963-February 1964 totaled 1,794,500 cases. Principal countries of destination were: West Germany--659,260 cases; Canada--205,200; Great Britain--148,350; Switzerland--114,860; Lebanon--88,910; Aden--88,250; Belgium--83,160; Netherlands--82,040; Saudi Arabia--61,700; Okinawa--53,050; Kuwait 42,900; Australia--30,230 or 33,230 cases (due to misprint, it is not possible to determine which is the correct figure); and Italy--24,270 cases. (Suisancho Nippo, March 23, 1964.)

The export market for Japanese canned tuna in oil continues to be very slow this year ever since the price per case (7-oz. 48's) declined by US\$0.30 in January 1964. The current Japanese export price per case (c.i.f.) of Indian Ocean bluefin tuna is reported to be US\$7.10. On the other hand, the Japanese domestic market price for that pack continued to hold steady at about the 2,330 yen (\$6.47) level. Consequently, Japanese exporting firms are not handling that product at the present time.

The ex-vessel price in Japan for frozen Indian Ocean bluefin (dressed) is presently 80 yen per kilogram (US\$202 a short ton). Japanese packers claim that at that price they cannot make any profit, but they are packing a small quantity of that species so as to keep their plants in operation. They also have in stock over 100,000 cases of bluefin tuna in oil. Unless that stock is moved, there will be little likelihood for improvement in the export market situation. (Suisan Tsushin, March 25, 1964.)

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Japan (Contd.):

CANNED TUNA IN BRINE EXPORTS TO U. S., 1958-1963:

Japanese canned tuna in brine exports to the United States increased steadily during 1958-1963, according to data compiled by the Japanese Fisheries Agency. During that 6-year period, the Japanese supplied 80-90 percent of United States total imports of canned tuna in brine. However, due to a decline in United States domestic production of canned tuna in calendar year 1963, the quantity of tuna canned in brine which can be imported into the United States during the calendar year 1964 at the 12.5-percent rate of duty is expected to total about 2,850,000 standard cases, about 5 percent less than 1963's 3,006,221 cases (48 7-oz. cans). This de-

| Year | Standard Cases ^{1/} | Percentage of Total U. S. Imports |
|----------------|------------------------------|-----------------------------------|
| 1963 | 2,301,600 | 84.4 |
| 1962 | 2,244,000 | 83.5 |
| 1961 | 2,217,000 | 79.9 |
| 1960 | 2,030,000 | 83.3 |
| 1959 | 2,122,000 | 80.6 |
| 1958 | 1,926,000 | 89.0 |

^{1/}48 7-oz. cans.

velopment in turn is expected to affect 1964 Japanese canned tuna exports to the United States. They are expected to decline below 1963 exports, which totaled 2,301,600 cases, valued at US\$35,206,000. (Suisan Keizai Shimbun, March 18, 1964.)

* * * * *

CANNED FISH EXPORT TARGET, FISCAL YEAR 1964:

The Agriculture and Fisheries Products Export Committee, Japanese Ministry of International Trade and Ministry, at a meeting on March 25, 1964, tentatively set the

| Commodity ^{1/} | FY 1964 Target | | FY 1963 Target | |
|-------------------------|----------------|------------|----------------|------------|
| | Qty. | Value | Qty. | Value |
| | 1,000 Cases | US\$ 1,000 | 1,000 Cases | US\$ 1,000 |
| Tuna | 4,445 | 37,513 | 4,250 | 34,912 |
| Salmon | 1,395 | 43,962 | 1,710 | 51,124 |
| Crab | 438 | 11,004 | 440 | 11,077 |
| Sardine | 100 | 780 | 500 | 3,625 |
| Saury | 1,650 | 10,680 | 1,370 | 7,773 |
| Mackerel | 600 | 3,948 | 562 | 3,398 |
| Total | 8,628 | 107,887 | 8,832 | 111,909 |

^{1/}Commodities listed as "shellfish and others" not included.

fiscal year 1964 (April 1964-March 25, 1965) export target for canned agricultural and fishery products at 17.3 million cases, valued at US\$161 million. The export target for canned fishery products (not including shellfish) totaled 8,628,000 cases, valued at US\$107,887,000.

To achieve the export target, the Export Committee drafted the following recommendations:

1. In order to ensure supply of raw material for tuna packers, the Government should: (a) exercise a greater degree of administrative leadership to facilitate collective bargaining between producers and packers; (b) provide a greater degree of leadership to encourage and promote delivery of raw material to packers; and (c) investigate fishery resources to ensure availability of raw material for canning purposes.

2. Add to the list of war reparations payable in kind to the Philippines, Burma, and Indonesia canned sardine, saury, mackerel, squid, and salmon (particularly pink salmon).

3. Establish measures authorizing extension of government loans to the canned foods joint sales companies under the same conditions applicable to canned foods exporters. This should be done promptly since the export income exemption system is to be abolished.

4. Devise measures to prohibit exports of commodities on which substantially higher duties would be imposed through application of the EEC common tariff.

5. Increase government subsidy for expenses necessary to conduct sales promotion in foreign countries.

6. Extend the sugar rebate system to all export commodities, simplify rebate procedures, and liberalize sale of sugar with over 98 percent sugar content.

7. Negotiate with the United States for reduction of U. S. tariff on tuna packed in oil, from the present ad valorem rate of 35 percent to the 12.5-percent rate applied to imports of tuna packed in brine; on canned crab, from the present 22.5 percent to 11.25 percent; and on canned clam, down to 10 percent.

8. Negotiate with the United States for removal of U. S. restrictions on imports of canned tuna in brine.

9. Promote exports of commodities suitable for export to foreign countries.

10. Reduce can prices.

11. Develop measures whereby countries in southeast Asia (particularly Indonesia) and United Arab League countries will increase their canned sardine, saury, and mackerel import quotas.

12. Take steps to forestall the enactment of import bans or restrictions by foreign countries presently buying Japanese canned fishery products.

13. Establish favorable public transportation fees (such as railway and harbor cartage fees) for export canned food products, and provide special arrangements for the utilization of railway freight cars during the packing season. (Nihon Suisan Shimbun, March 27, 1964.)

* * * * *

CANNED SALMON SOLD TO AUSTRALIA:

The Japan Canned Salmon Sales Company contracted to deliver in June 1964, a total of 44,000 cases of second-grade red salmon halves (Japanese can size--No. 2 flat 48 cans per case) to two Australian trading firms. This sale cleared the stock of second-grade red salmon held by the sales company. As of

Japan (Contd.):

early April the company still had a very limited quantity of second-grade pink salmon on hand. (Suisancho Nippo, April 7, 1964.)

* * * * *

EXPORTERS ADOPT TUNA PROGRAM FOR FISCAL YEAR 1964:

The Japan Frozen Foods Exporters Association, at a special general meeting on March 19, 1964, approved the following export quotas for overseas bases for fiscal year 1964 (April 1964-March 1965): American Samoa--25,000 short tons; Espiritu Santo, New Hebrides--6,000 tons; Noumea, New Caledonia--7,500 tons; Levuka, Fiji Islands--9,000 tons; Penang, Malaysia--6,000 tons; Saint Martin, Netherlands Antilles--2,000 tons; total 55,500 short tons.

The overseas bases export quotas are to be distributed to Association members in proportion to their previous year's export performance record. However, for bases (newly established) without export performance records, the export quotas are to be allotted on the basis of the sales contracts concluded between exporting firms and the joint companies which operate the bases. In this case, 10 percent of the allotted quota is to be turned over to the Association, which will be pooled (referred to as adjustment quota), and distributed to Association members with actual performance records on a first-come first-served basis.

The Association also agreed on an assessment of 30 yen (US\$0.083) a short ton for fresh tuna landed in overseas bases. The assessment on frozen tuna is 90 yen (\$0.25) a short ton, as before.

In addition, the Association agreed on a special assessment of 30 yen (\$0.083) a metric ton for the purpose of raising 1,770,000 yen (\$4,917) to be used for the promotion of tuna sales in Europe and Africa. Of this amount, 1.5 million yen (\$4,167) would be used exclusively for tuna promotion in Italy. This amount represents the Association's contribution to the joint Italian-Japanese tuna promotion effort, which had been proposed by the Italian tuna industry.

Earlier, at a meeting on March 2, the Association had agreed on contributing a total of six million yen (\$16,667) for the joint pro-

motion program. Of that sum, the Japanese Government was to be requested to contribute half, and Japanese producers and exporters one-fourth each. (Suisancho Nippo, March 23; Suisan Tsushin, March 4 and 21, 1964.)

* * * * *

SUMMER ALBACORE TUNA LANDED AT YAIZU:

The first large landing of summer albacore was made at Yaizu, Japan, on April 2, 1964--120 metric tons were landed on that day. Japanese tuna packers paid as much as 125 yen a kilogram (US\$315 a short ton) for the fish. (Suisan Keizai Shimbun, April 4, 1964.)

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JAPAN FROZEN TUNA SALES COMPANY REDUCES LEVY:

At a meeting in Tokyo on March 30, 1964, the Japan Frozen Tuna Sales Company agreed to reduce the levy on frozen tuna consigned to the company by two-tenths of one percent--from three-tenths to one-tenth of one percent. The Sales Company has been under strong criticism from certain producers who insisted that the management of that company should be rationalized. (Nihon Suisan Shimbun, April 1, 1964.)

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REGULATIONS FOR OVERSEAS TUNA BASES REVISED:

The Japanese Fisheries Agency on March 31, 1964, issued a directive revising the existing regulation governing overseas tuna base operators. Effective April 1, the directive allows the landing of frozen tuna at overseas bases--heretofore only fresh (iced) tuna was permitted to be landed at overseas bases.

The Agency also reduced the 27,000-ton tuna quota for American Samoa by 2,000 tons, and applied that amount as the quota for the newly established tuna base at St. Martin, Netherlands Antilles. The landing quotas for all other bases (Penang, Fiji Islands, Noumea, and Espiritu Santo) remain the same. (Nihon Suisan Shimbun, April 3, 1964.)

* * * * *

POOR FISHING REPORTED BY VESSEL FISHING BOTTOMFISH IN GULF OF GUINEA:

The Koyo Maru (314 gross tons), which has been operating in the Gulf of Guinea (Atlantic

Japan (Contd.):

Ocean) since late January 1964, reports poor fishing. That vessel, which had been dispatched to the Gulf for the purpose of exploring grounds not suited for trawling, is scheduled to remain on the fishing grounds for one year. Fishing with different types of line gear, the Koyo Maru on good days caught as much as 3.5 metric tons of bottomfish a day, but is also said to have experienced many days of poor fishing. (Suisan Tsushin, March 24, 1964.)

* * * * *

WHALE OIL EXPORT TARGETS:

The Japanese Ministry of International Trade and Industry, at a meeting on March 18, 1964, adopted the following whale oil export targets for fiscal year 1964 (April 1964-March 1965): baleen whale oil--99,400 metric tons (value US\$20,742,000); sperm whale oil--118,000 metric tons (value \$24,535,000). (Suisancho Nippo, March 21, 1964.)

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NEW OFFSHORE TUNA FISHERY:

As of March 23, the Japanese Fisheries Agency had received over 2,000 applications to engage in the newly-designated offshore tuna fishery (north of 10° N. latitude and west of 160° E. longitude) in the North Pacific. The fishery is to be restricted to a total of 1,850 tuna vessels in the 20- to 50-ton range. Deadline for filing applications was March 24. (Suisan Keizai Shimibun, March 24, 1964.)

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GOOD SKIPJACK TUNA FISHING NEAR MARIANAS:

Japanese tuna vessels operating out of Japan found excellent skipjack fishing near the Mariana Islands in early March. The area, which was discovered last year, is centered at 11° N. latitude-135° E. longitude, about 720 kilometers southwest of Guam, and was yielding large fish of about 6.5 pounds. (Nihon Suisan Shimibun, March 18, 1964.)

* * * * *

OVERSEAS TUNA BASE OPERATORS URGED BY GOVERNMENT TO ORGANIZE:

Overseas tuna base operators in American Samoa, Fiji Islands, Espiritu Santo (New Hebrides Is.), Penang (Malaysia), and Noumea (New Caledonia) are being encouraged by the Japanese fisheries Agency to organize a liaison council so that problems of mutual interest, such as ex-vessel price, export, wage

and labor problems, and the decline in hook rate in nearby fishing grounds, can be fully aired. The Agency feels that the time has now come for all the overseas tuna base operators to get together to fully explore those problems, which are common to all the bases. The Agency also feels that, despite the existence of a sellers' market, the overseas base operators were not in position to favorably negotiate sales contracts or fish-quality inspection arrangements with either the exporters or United States tuna packers. As a result, they need to organize to improve their status. (Nihon Suisan Shimibun, April 3, 1964.)

* * * * *

PORTABLE-BOAT TUNA MOTHERSHIP FISHERY:

The portable-boat-carrying tuna mothership fleet in Japan consists of 44 motherships carrying piggyback a total of 120 portable boats (each 20 tons in size).

The Japanese Portable-Boat-Carrying Tuna Mothership Conference submitted a proposal to the Fisheries Agency requesting that not only mothership-to-mothership transfer of catches be authorized but that portable-boat-carrying tuna motherships be also authorized to transfer or receive fish from regular distant-water tuna vessels. The Agency is reported to be opposed to this plan. According to the Agency, the objective of the proposal is to make it possible for the portable-boat-carrying motherships to fish with 300-ton distant water tuna vessels, which would serve as catcher vessels to the motherships. This will then result in completely changing the existing structure of the portable-boat-carrying tuna mothership fishery. Furthermore, the Agency holds that the intensification of fishing effort at the present time is not desirable from a resource standpoint. (Suisancho Nippo, March 17, 1964.)

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TUNA MOTHERSHIPS SAIL FOR TAHITI AND FIJI:

The Japanese tuna mothership Nojima Maru (8,800 gross tons), accompanied by 65 catcher vessels, was scheduled to depart Kobe, Japan, on May 10, 1964. The firm which operates that fleet has notified the Japanese Fisheries Agency of its intention to operate the mothership in Tahitian waters this year.

The tuna mothership Yuyo Maru (5,040 gross tons), accompanied by 55 catcher vessels and two carrier vessels, was scheduled

Japan (Contd.):

to depart Tokyo on May 20 for the tuna fishing grounds off the Fiji Islands. (Suisancho Nippo, April 8, 1964.)

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TUNA MOTHERSHIP OPERATIONS IN SOUTH PACIFIC:

A large Japanese fishing company, which recently submitted an application to the Japanese Fisheries Agency to operate two tuna mothership fleets in the South Pacific Ocean this year (one in the summer and the other in the fall) is having a difficult time signing up sufficient tuna fishing vessels to organize the fall fishing expedition. That company may cancel its plans for the fall operation, according to speculation.

The firm's tuna mothership Yuyo Maru (5,040 gross tons) is scheduled for the summer operation. She was scheduled to depart Japan on May 20, 1964, accompanied by a fleet of 55 fishing and support vessels. (Suisan Tsushin, March 23, 1964.)

Editor Note: Although Japanese Government regulations permit tuna-fishing vessels up to 240 tons gross to participate in the tuna mothership-type fishery, most of the catcher vessels participating in that fishery are vessels under 100 tons gross. Owners of this class of vessels are reported to be very reluctant about operating their vessels in the South Pacific this year, due to the steady decline in catch rate per hook in that area, which was quite low in 1963.

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FISHERIES CENSUS, 1963:

The Japanese Ministry of Agriculture and Forestry on April 1, 1964 released preliminary data from its third national fisheries census. Started on November 1, 1963, the census includes data as of March 23, 1964.

The census showed that:

1. Fisheries enterprises (families or organizations which operated fishing vessels over 30 days during the year) totaled 234,000 in 1963 as against 252,000 in 1953, a decline of 7 percent in 10 years. Decline was widespread throughout Japan. Only the prefectures of Iwate, Miyagi, Aichi, Mie, Ehime, Fukuoka, and Kumamoto showed gains.

The national trend, by regions, was as follows: (a) Hokkaido Region--decline of 16 percent, mainly due to failure of herring fishery. (b) Northern Pacific Coast Region--Aomori, Fukushima, and Ibaraki prefectures showed a decline. Iwate and Miyagi showed an increase as a result of expansion in laver cultivation. (c) Central Pacific Coast Region--Tokyo showed a decline of 24 percent; Chiba, Kanagawa, and Shizuoka showed decreases. Aichi and Mie showed a 30-percent increase. Aichi's increase was in laver cultivation; Mie's in-

crease in pearl cultivation. Tokyo's and Chiba's decline was mainly attributed to abandonment of laver cultivation fields due to industrial expansion in the Tokyo Bay region. (d) South Pacific Coast Region--Ehime and Kochi showed a sharp gain, Oita no gain, and other prefectures in the region showed a decline ranging from 10-20 percent. Sharp rises in Ehime and Kochi were due to increases in laver and pearl cultivation. (e) Northern Japan Sea Region--All prefectures, except Akita, registered a decline of 20-30 percent, due to the stagnant condition of the set-net fishery, coastal trawl fishery, and hook-and-line fishery. Akita showed a drastic decline of over 50 percent due mainly to the land reclamation program at Hachirogata Lagoon. (f) Western Japan Sea Region--All prefectures showed declines, particularly Tottori. Decline was attributed to stagnant condition of trawl fishery, hook-and-line fishery, and the land reclamation project at Nakaumi. (g) East China Sea Region--Laver cultivation in the Ariake Sea showed a great increase. Fukuoka and Kumamoto (which border this sea) registered increases of 30 and 50 percent, respectively. (h) Inland Sea Region--All prefectures bordering the Inland Sea showed a decline of 20-30 percent. Decline was attributed in great part to abandonment of fishing grounds due to industrial development.

2. Families engaged in fishing for others. Families which did not operate their own fishing vessels in 1963 but which fished at sea for others for a period of 30 days or more during that year totaled approximately 171,000 as compared to 240,000 in 1953, a decline of 29 percent. The decline was particularly great for the prefectures bordering the Japan Sea and the Inland Sea. The prefectures of Iwate, Miyagi, Fukushima, and Kanagawa showed increases of 20-30 percent. They are attributed to increases in enterprises requiring the employment of a great number of fishermen (such as at the large fishing ports at Miyako, Shiogama, and Misaki), and to the employment of larger fishing vessels and changes in production base resulting from expansion of port facilities.

3. Motorized vessels. Motorized vessels owned by fishing enterprises (families or organizations which operated fishing vessels over 30 days during the year) totaled approximately 146,000 (as of survey date) as compared to 111,000 in 1963--an increase of 31 percent. By vessel size, the number of motorized vessels under five gross tons totaled 37,000, an increase of 40 percent. Of fishing vessels over 200 gross tons, there was a fourfold increase in numbers of vessels between 200-500 tons, and a tenfold increase in vessels over 500 tons.

People engaged in fisheries (those over 15 years of age). The number of people engaged in fisheries in 1963 totaled 490,000, as compared to 607,000 in 1953, a decline of 23 percent. The prefectures of Iwate, Mie, and Fukuoka each showed increases of about 10 percent, but all other prefectures, particularly those bordering the Japan Sea and the Inland Sea, showed a decline. (Nihon Suisan Shimbun, April 3, 1964.)

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COMPENSATION FOR LOSS OF FISHING GEAR AND CATCH BEING STUDIED:

The Japanese Fisheries Agency is negotiating with the Ministry of Finance to revise a section of the existing fisheries legislation on vessel loss compensation so that vessel owners who dump their catch, gear, and fuel overboard to lighten their vessels, so as to prevent loss or damage to their vessels when they run aground, will be compensated for such losses. The Agency hoped to have the revision become effective from April 1, 1964, but as of early April, the matter of special premium rates had not been fully resolved.

Through a directive issued October 1963 by the Director of the Japanese Fisheries

Japan (Contd.):

Agency, vessel owners are now being compensated for loss of gear which they have been compelled to abandon on the high seas as a result of being pursued by foreign patrol vessels. This directive is to be incorporated within the proposed revision. Only vessels covered under a special agreement will be eligible for compensation. (Nihon Suisan Shimbun, April 3, 1964.)

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VESSEL CONSTRUCTION:

Loan Program Trends: Due to inadequate funds in the Government-operated Development Bank, the Japanese Ministry of Agriculture and Forestry (MAF) is planning on limiting the programs it hopes to have financed by the Bank. For fiscal year 1964 (April 1964-March 1965), the MAF is actively encouraging the Development Bank to make available loans for the construction of large distant-water trawlers. However, the Bank feels that it will be difficult to accommodate all demands placed on the limited funds available for loan purposes, unless adjustments are made. Accordingly, the Fisheries Agency (MAF) plans to review existing conditions, possibly establishing a priority system for those seeking loans for the construction of distant-water trawlers. (Suisan Keizai Shimbun, March 20, 1964.)

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Permits Issued March 30, 1964: On March 30, 1964, the Japanese Fisheries Agency issued permits for the construction of 57 fishing vessels: 25 wooden vessels totaling 771 gross tons and 32 steel vessels totaling 4,323 gross tons. Included are permits for 2 small wooden salmon vessels under 39 tons gross, 8 steel 96-ton salmon vessels, 4 steel tuna vessels (one 99-ton, one 192-ton, and two 253-ton vessels), and 5 steel distant-water trawlers (one 92-ton, two 299-ton, and two 314-ton vessels). (Suisan Keizai Shimbun, April 1, 1964.)

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FISHERIES MISSION SCHEDULED TO VISIT UNITED STATES AND CANADA:

An official of the Japan Fisheries Association reports that his Association plans to sponsor a fisheries mission to the United States and Canada in July 1964.

The mission will consist of 15 members of the Japan Fisheries Association and its affiliated organizations, according to the Association's plans. The mission's tentative plans call for departure from Tokyo July 1, and return to Tokyo on July 28, 1964. Itinerary includes visits to the major fishery areas and fishing ports in Alaska, calls at Vancouver, B. C., and to fisheries centers in the State of Washington.

The official stated that the Japan Fisheries Association is aware of the intense concern that fisheries problems between the United States and Japan have aroused in the American fishing industry during the past several years, and that the purpose of the trip is to promote good will and understanding between the fishing industries of Canada, Japan, and the United States.

The Japanese mission will, for the first time, have an opportunity to gain better understanding of fisheries management and conservation practices conducted in Alaska as well as observe fishing operations. It is planned that members of the mission will brief the United States and Canadian authorities on the state of Japan's northern seas fisheries. In that connection, the Association official said that there will be no exchange of views on the revision of the North Pacific Fisheries Convention scheduled for discussion at Ottawa in 1964. (United States Embassy, Tokyo, March 30, 1964.)

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FISH MEAL OPERATIONS IN BERING SEA:

The Japanese oil-meal factoryship Tenyo Maru (11,581 gross tons), accompanied by 28 trawlers, departed Yokohama for the eastern Bering Sea on April 8, 1964. The fish-meal factoryships Gyokuei Maru (10,357 gross tons) and Hoyo Maru (former Renshin Maru of 14,094 gross tons) were scheduled to depart for the eastern Bering Sea from Hakodate on April 10 and 15, respectively. Each factoryship was accompanied by 30 trawlers. (Suisan Tsushin, April 8, 1964.)

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FISHERIES ASSOCIATION CONTRIBUTES MONEY TO ALASKA EARTHQUAKE VICTIMS:

A check for \$5,000, contributed by the Japan Fisheries Association to the victims of the Alaska earthquake, was presented to the

Japan (Contd.):

U. S. Deputy Chief of Mission, United States Embassy, Tokyo, on April 7, 1964. In making the presentation, the President of the Association, accompanied by other officials of that organization, read the following message:

"We have heard that the great earthquake which hit the Alaska district on March 28 dealt great damage to the area, and that the damage sustained by fisheries facilities was especially severe. We feel deep sympathy, and we, Japanese fisheries enterprisers, mainly those engaged in northern seas fisheries, have hereby decided to present \$5,000 in token of our deep sympathy.

"The amount, we are afraid, is very small, but we hope that it may perhaps serve as a primer. We wish to convey our heartfelt prayer that the victims of the earthquake will achieve reconstruction quickly."

The U. S. Deputy Chief of Mission acknowledged the contribution and in reply described the action of the Japan Fisheries Association as an example of the cooperation and sympathetic understanding which exists between our two countries.

The check, which was made out to the United States Ambassador to Japan, has been endorsed for payment to the Treasurer of the State of Alaska. (United States Embassy, Tokyo, April 13, 1964.)

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FISH SAUSAGE PRODUCTION:

The Japan Fish Sausage Association stated that fish sausage production for fiscal year 1963 (April 1963-March 1964) was expected to show an increase of over 10 percent, and was estimated to total 125,000 metric tons. In fiscal year 1962 the production was 114,120 metric tons. (Suisancho Nippo, April 6, 1964.)



Korea

TUNA FISHING VESSEL LAUNCHED:

A 145-ton tuna vessel was launched on April 14, 1964, at Pusan, Korea. The vessel is 1 of 3 tuna vessels being constructed by a Pusan shipyard for a Korean company under

a loan from a United States firm. The vessel is scheduled to operate in the Southwest Pacific and land tuna at American Samoa. The other two vessels are expected to be completed in June 1964 and dispatched to the Southwest Pacific.

In addition to their construction program, the Koreans are importing fishing vessels in order to increase their fisheries catch. (United States Embassy, Seoul; April 20, 1964.)



Mexico

ENSENADA FISHING INDUSTRY:

The port of Ensenada in Baja California is one of Mexico's most important fisheries centers. The greater part of the canned fish produced in Mexico originates in Ensenada, as do virtually all of Mexico's abalone and spiny lobster exports.

Canning: Ensenada's greatest importance as a fishing port stems from its canneries. Three active canneries are located in Ensenada and one is in the suburb of El Sauzal.

The three canneries in Ensenada pack sardines and mackerel. As none of them are located directly on the waterfront, the fish must be trucked from vessel to plant. Fishing vessels lie in the harbor and unload directly into amphibious landing craft which churn their way across the harbor, emerge on a gently sloping sandy beach, and proceed to the canneries over city streets. The fish are cut and packed by hand.

The cannery at nearby El Sauzal is the largest fish canning enterprise in Mexico with an annual production of about 500,000 cases. Sardine, mackerel, and tuna are packed at the mechanized El Sauzal cannery which has fish-cleaning and filleting machines. This integrated plant also operates: (1) a tomato cannery, primarily for the tomato sauce used in sardine canning; (2) a reduction plant for the manufacture of fish meal, oil, and solubles from cannery offal; and (3) a quality control laboratory. In the spring of 1964, the El Sauzal cannery began building a can-making factory as a joint venture with the United States firm, which now supplies most of the cans used by the Mexican plant.

The El Sauzal harbor is too shallow for most fishing vessels, so the company has ob-

Mexico (Contd.):

tained space at the general cargo dock in Ensenada where it has moored a barge equipped with suction pumps that can unload two vessels at a time. Belt conveyors carry the fish from the barge to trucks which haul the fish five miles to El Sauzal.

Currently the entire fish pack at Ensenada and El Sauzal is sold on the domestic Mexican market. The demand for canned fish is growing rapidly in Mexico and all four plants operate to capacity when fish are available.

Sardines are packed principally in 1-pound oval cans with tomato sauce or mustard, and in 8-ounce round cans in brine.

Pacific mackerel and jack mackerel are packed in a variety of ways. They are put up in 1-pound tall cans and sold as "mackerel, salmon-style." Small fish are packed in 1-pound ovals with tomato sauce as "sardines." Some of the larger fish are filleted and packed in oval cans as "sardine fillets."

Yellowfin, bluefin, albacore, and shipjack tuna are packed in half-pound round cans, as in the United States, and sold as atun (tuna).

Bonito and yellowtail are packed tuna-style and labeled either "economia atun" or "bonito."

Lobsters, Clams, and Abalone: Ensenada is an exporting center for the products of the fisheries for spiny lobster, abalone, and Pismo clam that are located in the villages along the coast to the south.

The spiny lobster fishery is conducted mainly by the "cooperativas" or cooperative groups of fishermen operating out of several villages as far south as Turtle Bay. In order to maintain an orderly marketing procedure, the Mexican National Bank for the Development of Cooperatives buys most of the spiny lobster production of the several fishing cooperatives. The bank contracts with a firm in Ensenada to cook, sort, freeze, and ship the lobsters, most of which are exported to the United States under contract with a buyer in California. The catch of the fishing camps close to Ensenada are brought to the central processing plant by truck. Those from the outlying camps come to Ensenada on vessels supplied with circulating sea water to keep the spiny lobsters alive. The first carrier vessel planned specifically for hauling spiny lobsters has been ordered by the Cooperative

at Mazatlan. Although designed for the lobster fishery, the vessel will be able to operate in other fisheries during the closed season.

The 1963/1964 spiny lobster fishing season (October 1-March 15) in Baja California yielded a catch of 840 metric tons (live weight) as compared with 750 tons in the previous season, according to the Mexican Department of Fisheries.

Pismo clams are dug by the members of fishery cooperatives along the beaches near San Quintin. Most of their production is shucked and shipped as clam meats to a canner in California.

Recognizing the large clam resource on the miles of beaches between San Quintin and Abreojos, Mexican interests are attempting to interest United States chowder canners in a large-scale harvest of pismo clams using modern clam dredges.

The abalone fishery was started many years ago by Japanese divers. Originally the abalone meat was dried for export to the Orient. Now all diving in the Mexican abalone fishery is done by members of the Mexican fishermen's cooperatives. Abalone canneries are located at Turtle Bay and Cedros Island, the most important centers of the fishery. Cooperatives in Ensenada and El Rosario also contribute to the catch. Canned abalone, in 1-pound tall cans, is the principal product, although the production of frozen abalone slices is becoming important.

Although domestic sales of canned abalone are increasing, most of the output is exported. In 1962, exports of canned abalone (mainly to the United States) totaled 6,784,000 pounds, valued at US\$2.3 million. In 1962, exports of frozen sliced abalone (almost entirely to the United States), reached 390,000 pounds with a value of \$342,000.

Kelp and Agar Agar: Giant kelp is abundant along the Baja California coast from the United States border to several hundred miles south. Considerable quantities are harvested in the Ensenada area and exported without processing to San Diego. The buyer uses the "sargaso" to augment its own harvest of the same species from California waters for the manufacture of alginates for use in a great variety of products. About 23,300 short tons (wet weight) of giant kelp were exported in 1962, according to the Mexican Department of Fisheries.

Mexico (Contd.):

Another seaweed, gelidium, is gathered at Ensenada and the fishing camps down the coast. It is dried at the camps and exported for use in the manufacture of agar-agar. A total of 756,000 pounds (dried weight) of gelidium was shipped in 1962, according to the Mexican Department of Fisheries.

Fishing Fleet: Fishing and the harvest of seaweed are a major factor in the economy of Ensenada. They are particularly important to the sparse population of the villages to the south.

According to the Ensenada office of the Mexican Department of Fisheries, the cooperatives in the coastal area served by Ensenada include 1,650 active fishermen. An additional 700 crew members are employed by the purse seiners and smaller vessels fishing for sardines, mackerel, and tuna. The canneries in Ensenada and El Sauzal employ about 800 workers.

Although catches are seasonal, one aspect or another of the fisheries provides some employment throughout the year. The proximity to Southern California results in relatively high wages and high prices for fish.

The Ensenada fishing vessels include small craft which fish for the local fresh market, a fleet of small to medium purse seiners, and a fleet of 10 large purse seiners. Practically the entire fleet originated in California. Some vessels were bought outright by Mexican fishermen or canneries. Others came to Ensenada under United States ownership and with United States crews to fish for the canneries. Gradually the United States crews were replaced by Mexican fishermen and the boats passed into Mexican ownership. It is reported that the entire fleet is now locally-owned.

The high seas fleet of 10 modern purse seiners fish for the cannery at El Sauzal. The vessels range in capacity from 100 to 300 tons. Six of those vessels are sardine and mackerel seiners capable of fishing several hundred miles to the south and returning their catches under brine refrigeration. The cannery, is therefore, not dependent on seasonal runs in local waters. The other four large purse seiners are tuna vessels that range as far as South America, and are equipped with modern electronic aids to fish-

ing, nylon nets, and power blocks for net hauling.

Fisheries College: Ensenada is also the location of a fisheries college. Known as the "Escuela Superior de Ciencias Marinas," it is part of the Autonomous University of Baja California. Under the direction of a former scientist of the Mexican Department of Fisheries, the fisheries college has a faculty of 11 and a student body of about 50. The college offers a four year course leading to the degree of "Oceanologo" or oceanologist (the term covers both physical and biological oceanography). Because the college is new, it now has students in the first two classes only.

In addition to the marine college, the university also operates a preparatory school in Ensenada at the high school level. Because classes are conducted in the late afternoon and evening, both the college and the preparatory school can draw on the talent of the local industrial community.

Students graduated by the fisheries college will help relieve Mexico's shortage of marine scientists. (United States Embassy, Mexico, April 27, 1964.)

Note: See Commercial Fisheries Review, December 1963 p. 73; June 1963 p. 83.

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SHRIMP VESSELS TO FISH FOR FRENCH GUIANA:

Some 14 shrimp vessels accompanied by a small freezer ship, which left the port of Mazatlan to fish in French Guiana, are reported to have reached Trinidad and may already be operating off South America. The vessels are said to be fishing for the same San Diego, Calif., importer who handled their shrimp catches in Mexico. About 6 other Mazatlan shrimp vessels are awaiting government approval to depart and several vessels at Salina Cruz have so far failed to receive authority to leave.

Although the vessel operators anticipate better catches and increased profits in the newly-developed fishery off French Guiana, Mexican fishing industry sources indicate that the increasing friction between boat owners and the crews who belong to fishermen's cooperatives hastened the move to new shrimp grounds. (Fisheries Attache, United States Embassy, Mexico, April 10, 1964.)

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Mexico (Contd.):

MANNING SHRIMP VESSELS WITH FISHERMEN NOT MEMBERS OF COOPERATIVES:

Another development in the disagreement between shrimp boat owners and fishermen's cooperatives is being watched with great interest by the entire industry as well as by labor organizations. Some months ago a boat owner in Salina Cruz found what appeared to be a way to man his boats with fishermen who are not members of cooperatives, thus avoiding the necessity of making contract agreements. Although the law reserves shrimp fishing to members of cooperatives, one clause permits "free fishing." After a great deal of effort the Salina Cruz boat owner succeeded in obtaining official permission for nonmember crews. Fourteen vessels are reported to have started "free fishing" on March 30, 1964. If the "free fishing" effort succeeds, it may revolutionize all the fisheries now reserved to cooperatives or result in the passage of tighter laws to protect the cooperatives. (Fisheries Attache, United States Embassy, Mexico, April 10, 1964.)



Netherlands

EXPERIMENTAL OFFSHORE FISHING TO CONTINUE:

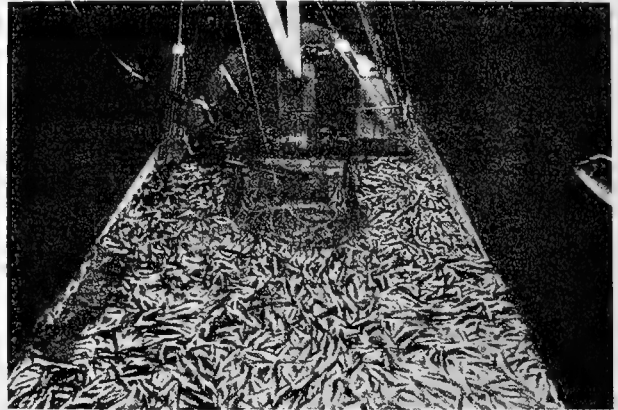
Experimental distant-water fishing by 8 Dutch trawlers outside their customary fishing grounds in the North Sea will be continued, according to a statement on March 19, 1964, by the Dutch Minister of Agriculture and Fisheries before the Permanent Committee on Fisheries of the Second Chamber of the Netherlands Parliament. He said that, so far, the experiment had not been a paying proposition, but owners of the fishing vessels involved desired its continuation and expansion. The Government will continue to subsidize the experiment, for which fl 1 million (US\$278,000) annually has been made available for a period of 3 years. The number of vessels involved in the experimental distant-water fishing project may be increased to 10 trawlers. (United States Embassy, The Hague, April 12, 1964.)



Norway

FISHERIES TRENDS:

March-April 1964: **HERRING:** A total of 296,000 metric tons of winter herring were landed by Norwegian fishermen during the season which ended March 25, 1964. That was the best result since 1960 and a good re-



Homeward bound loaded with herring.

covery from the depressed levels of 1963. Almost half of the 1964 winter herring catch was made in waters off the Lofoten Islands, which were previously noted for their large cod fishery.

COD: Despite the unusually good weather, this year's Lofoten cod fishery has been disappointing, yielding a catch of only 37,816 tons as of March 28, 1964, as compared with 47,975 tons by the same date in 1963, and 61,661 tons in 1962.

WHALING: At the end of the 1963/64 season, the 4 Norwegian Antarctic whaling expeditions had produced 251,230 barrels of whale and sperm oil. This was 26,585 barrels more than the same expeditions produced in 1962/63. In that season, however, the whale factoryship Sir James Clark Ross was put out of commission on January 27, 1963, and failed to resume operations.

FISHING VESSEL CONSTRUCTION FOR GHANA AND MOROCCO: The first of seven 231-foot stern trawlers, to be built for the Ghana Fishing Corporation by Norwegian Shipyards, was launched in early 1964. A comprehensive training program for the Ghanaian crews that will man the vessels has been planned by the Norwegian Development Assistance, in cooperation with private firms.

Norway (Contd.):

A Norwegian shipyard near Molde has obtained a contract to build twenty 63-foot fishing vessels for a Moroccan company within a 20-months period. The total price for the vessels, electronic equipment, engines, and gear will be about Kr. 10.8 million (US\$1.5 million). All equipment will be delivered by Norwegian companies. (News of Norway, April 16, 1964.)

Note: Norwegian kroner 7.17 equal US\$1.00.

Late March 1964: HERRING: A total of 291,725 metric tons of winter herring had been landed by Norwegian fishermen as of March 24, 1964. That was the best result

since 1960 when the herring catch by the same date amounted to 322,734 tons. A total of 85.1 percent of the 1964 winter herring catch was processed into meal and oil, as against 53.6 percent in 1960.

COD: There was some improvement in the Lofoten cod fishery in late March 1964, but fishermen in that area had landed only 12,441 tons as of March 25, 1964, at least 5,000 tons less than the Lofoten cod catch by the same date in 1963. (News of Norway, April 2, 1964.)

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CANNED FISH EXPORTS, 1962-1963:

Norwegian exports of canned fishery products in 1963 were down 8.9 percent in quan-

Table 1 - Norwegian Exports of Canned Fishery Products by Type, 1962-1963

| Product | January-December 1963 | | | January-December 1962 | | |
|---------------------------------|-----------------------|--------------|-----------|-----------------------|--------------|-----------|
| | Quantity | Value | | Quantity | Value | |
| | Metric Tons | 1,000 Kroner | US\$1,000 | Metric Tons | 1,000 Kroner | US\$1,000 |
| Smoked brisling in oil | 4,793 | 32,785 | 4,579 | 5,480 | 36,821 | 5,150 |
| Smoked brisling in tomato . . | 575 | 3,175 | 443 | 808 | 4,635 | 648 |
| Smoked small sild in oil . . . | 11,478 | 48,482 | 6,771 | 12,185 | 52,300 | 7,315 |
| Smoked small sild in tomato . . | 1,447 | 5,234 | 731 | 1,157 | 4,102 | 574 |
| Unsmoked small sild in oil . . | 869 | 2,812 | 393 | 782 | 2,589 | 362 |
| Unsmoked small sild in tomato . | 61 | 225 | 31 | 117 | 442 | 62 |
| Kippered herring | 3,149 | 13,442 | 1,877 | 4,242 | 18,362 | 2,568 |
| Unsmoked herring in tomato . . | - | - | - | 110 | 270 | 38 |
| Mackerel | 666 | 3,117 | 435 | 685 | 3,219 | 450 |
| Roe, unclassified | 1,412 | 5,132 | 717 | 1,232 | 4,476 | 625 |
| Soft herring roe | 719 | 3,545 | 495 | 797 | 3,413 | 477 |
| Fish balls | 519 | 1,517 | 212 | 572 | 1,515 | 212 |
| Other canned fish | 162 | 1,212 | 169 | 129 | 946 | 132 |
| Shellfish | 1,545 | 16,486 | 2,303 | 1,839 | 19,681 | 2,753 |
| Total | 27,457 | 137,164 | 19,156 | 30,135 | 152,771 | 21,366 |

Table 2 - Norwegian Exports of Canned Fishery Products^{1/} by Country of Destination, 1962-1963

| Country of Destination | January-December 1963 | | | January-December 1962 | | |
|---------------------------------|-----------------------|--------------|-----------|-----------------------|--------------|-----------|
| | Quantity | Value | | Quantity | Value | |
| | Metric Tons | 1,000 Kroner | US\$1,000 | Metric Tons | 1,000 Kroner | US\$1,000 |
| Finland | 185 | 1,187 | 166 | 143 | 881 | 123 |
| Sweden | 396 | 2,036 | 284 | 421 | 1,984 | 277 |
| Belgium-Luxembourg | 649 | 3,124 | 436 | 682 | 3,229 | 452 |
| Ireland | 295 | 1,087 | 152 | 314 | 1,137 | 159 |
| France | 278 | 1,151 | 161 | 398 | 1,616 | 226 |
| Netherlands | 219 | 893 | 125 | 195 | 844 | 118 |
| United Kingdom | 4,859 | 21,608 | 3,018 | 5,412 | 24,802 | 3,469 |
| West Germany | 782 | 3,012 | 421 | 673 | 2,654 | 371 |
| East Germany | 1,479 | 5,295 | 739 | 1,478 | 5,072 | 709 |
| South Africa Republic | 212 | 981 | 137 | 1,112 | 4,647 | 650 |
| Iraq | 1,233 | 5,126 | 716 | 102 | 384 | 54 |
| Canada | 922 | 5,527 | 772 | 1,192 | 6,920 | 968 |
| United States | 11,900 | 61,597 | 8,603 | 13,234 | 68,765 | 9,617 |
| Australia | 1,947 | 7,150 | 999 | 1,746 | 1,106 | 994 |
| New Zealand | 503 | 2,144 | 299 | 251 | 1,022 | 143 |
| Other Countries | 2,186 | 7,797 | 1,089 | 1,875 | 6,831 | 955 |
| Total ^{2/} | 28,045 | 129,715 | 18,117 | 29,228 | 137,894 | 19,285 |

^{1/}Does not include exports of canned shellfish.

^{2/}Totals are slightly larger than the combined exports of canned fish (excluding shellfish) shown in table 1.

Note: In 1962, Norwegian kroner 7.15 equaled US\$1.00; in 1963, Norwegian kroner 7.16 equaled US\$1.00.

Norway (Contd.):

tity and 10.3 percent in value from those in 1962. Norway's leading fishery exports--smoked brisling in oil, smoked small sild in oil, and kippered herring--were all affected by the decline.

The United States was Norway's most important market for canned fishery products, accounting for 42.4 percent of total shipments in 1963 and 45.3 percent in 1962.

Note: See Commercial Fisheries Review, July 1963 p. 88.

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SHIPYARD BUILDING FOUR PURSE SEINERS FOR CHILE:

A Norwegian shipyard is building four 120-gross-ton oceangoing purse seiners for Chile. One of the vessels was to be delivered in May 1964, another in June, and the other two later in the summer. The specifications of each vessel are reported to be: 101 feet 6 inches in length, 24 feet wide, and 13 feet in depth.

No information is available on the prices and payment arrangements for the vessels but it is believed that part of the payment is being financed through a Norwegian Government guaranteed export credit loan at 6-percent interest. (United States Embassy, Oslo, April 7, 1964.)



Peru

FISH-MEAL INDUSTRY TRENDS, EARLY 1964:

The financial difficulties of the Peruvian fish-meal producers are now receiving Government attention. The Peruvian Chamber of Deputies announced on March 13, 1964, the formation of a special committee to study the industry's problems. Special attention will be given to the advisability of tax relief and to possible changes in the established marketing system. The National Fisheries Society is preparing a proposal to the Government for taxation based upon profits as an alternative to the present tax based on output.

The financial squeeze in the Peruvian fish-meal industry is based on excess capacity, coupled with the poor equity base of many producers. Those problems are now being compounded by the disappointing fish-meal

yield per ton of anchoveta. While the Peruvian fisheries catch in January 1964 hit an all-time high of more than one million metric tons, only slim profits were reported in the fish-meal industry. Eight small plants were reported to have closed down.

Tax relief could be a significant short-term boost for hard-pressed producers, but the eventual elimination of the inefficient, poorly capitalized plants may be inevitable. However, the financial problems of individual producers are not likely to significantly affect overall production for the year. Well-run, soundly capitalized plants are still operating profitably, and the longer term prospects for the industry are considered bright enough to keep output up through the present period of financial stringency. Also, private investment capital from foreign countries continues to move into the industry. (United States Embassy, Lima, March 26, 1964.)

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FISH MEAL EXPORTS BY COUNTRY OF DESTINATION, JANUARY-SEPTEMBER 1963:

The United States was the leading market for Peruvian fish meal during January-Sep-

| Peruvian Fish Meal Exports by Country of Destination, January-September 1963 | |
|---|-------------------------|
| Country of Destination | Quantity Metric Tons |
| United States: | |
| East Coast | 131,177 |
| West Coast | 54,118 |
| Hawaii | 500 |
| Total United States | 185,795 |
| Other Countries: | |
| Germany, West | 152,922 |
| Germany, Eastern | 35,618 |
| Austria | 3,570 |
| Australia | 2,442 |
| Belgium | 20,625 |
| Colombia | 2,465 |
| Czechoslovakia | 7,493 |
| Spain | 53,945 |
| Philippines | 3,235 |
| France | 34,409 |
| The Netherlands | 139,680 |
| Hungary | 16,598 |
| Great Britain | 36,936 |
| Ireland | 5,935 |
| Italy | 46,811 |
| Japan | 58,161 |
| Mexico | 18,609 |
| Poland | 9,750 |
| Sweden | 12,375 |
| Venezuela | 4,950 |
| Yugoslavia | 21,638 |
| Other ^{1/} | 7,123 |
| Total other countries | 695,290 |
| Grand total | 881,085 |
| ^{1/} Includes shipments to Bulgaria, Greece, Brazil, Canada, Malaysia, Rumania, Bolivia, Formosa and Honduras. | |
| Source: Peruvian National Fisheries Society. | |

Peru (Contd.):

tember 1963. During that period, Peruvian fish meal exports to the United States consisted of 131,177 metric tons shipped to east coast ports, 54,118 tons shipped to west coast ports, and 500 tons shipped to Hawaii. (United States Embassy, Lima, April 16, 1964.)

**Philippine Republic****PURCHASE OF SOUTH AFRICAN SARDINES APPROVED:**

On April 13, 1964, the President of the Philippine Republic approved the purchase of South African canned sardines by the National Marketing Corporation (NAMARCO). Contracts have been signed for 875,000 cases at a cost of 6.5 million pesos (US\$1,662,400). The first shipment of 200,000 cases is scheduled to arrive in May 1964. (United States Embassy, Manila, April 17, 1964.)

Note: Philippine pesos 3.91 equal US\$1.00.

**Poland****FISHERIES GOALS, 1964:**

Landings: The Polish fishing industry is committed to land 223,000 metric tons of salt-water fish in 1964. The state-owned fisheries are to increase their catch to about 184,000 tons in 1964; cooperative fisheries are to land 23,000 tons in 1964; and private fisheries are to land over 16,000 tons.

By area, the 1964 plan calls for a Baltic Sea catch of 91,000 tons; an Atlantic catch of 47,000 tons (as against 32,000 tons in 1963); and a North Sea catch of 85,000 tons. In accordance with plans to intensify fishing effort in the Atlantic, the mothership Kaszuby will be sent to the northwest Atlantic for the first time in 1964. The vessel will be accompanied by a fleet of 15 trawlers which will fish for herring off Nova Scotia and on Georges Bank. Plans also call for greater fishing effort off Iceland and in the Irish Sea.

It is expected that the 1964 catch will include about 76,000 tons of North Sea herring, 22,000 tons of Baltic Sea herring, 64,000 tons of cod, 14,000 tons of sprats, 13,000 tons of

mackerel, 12,300 tons of ocean perch, 4,700 tons of flatfish, 530 tons of eels, and 275 tons of salmon and trout.

Fishing Fleet: The increased landing goals in 1964 reflect the expansion of the Polish fishing fleet. Under current construction timetables, new vessels to be delivered to the state-owned fisheries in 1964 will include 3 "B-15-type" factory-trawlers, 1 "B-18-type" large freezer-trawler, and 6 "B-23-type" freezer-trawlers, as well as seven 2½-meter cutters. When working out the catch goals, it was assumed that the annual landings of a factory-trawler would average 4,500 tons and those of a "B-23" freezer-trawler would average 1,700 tons.

The cooperative fisheries expect to receive 6 new 17-meter cutters in 1964. The state-owned fisheries will also deliver several used 17-meter cutters to the cooperative fisheries.

Processing: Facilities for processing of the state-owned fisheries have also been called on to increase output. Their production goals in 1964 include 7,380 tons of fish fillets, 16,245 tons of preserved fish, 5,400 tons of pickled fish, 14,890 tons of cured fish, 2,520 tons of semicooked fish products, 7,660 tons of fish meal, and 1,750 tons of fish oils. The fish-processing industry is expected to supply the Polish market with 131,000 tons of fishery products in 1964 (excluding industrial products) as compared with 126,000 tons in 1963.

Considerable investment in the shore facilities of the Polish fish-processing industry is planned in 1964. Cold-storage facilities are to be constructed at Gdynia, Hel, and Władysławowo. The expansion effort in the Polish fishing industry will require sizable investments to mechanize handling, transportation, and preliminary processing at the fishing centers.

Overseas Bases: Because of excellent catches of mackerel and sardines off the Scilly Islands, a landings base for Polish vessels was arranged in Ostend, Belgium, in January 1964. Fish discharged there were frozen and then carried to Poland by refrigerated vessels. (Polish Maritime News, No. 65 and No. 66.)

A news article in the New York Journal of Commerce, March 30, 1964, reported that Poland was seeking permission to set up cold-storage facilities at the Welch port of Milford

Poland (Contd.):

Haven in the United Kingdom. This was said to be associated with the increased Polish fishing effort in the Atlantic. The article stated in part, ". . . Polish state fisheries representatives in Britain hint that they may meet some difficulty in setting up the Milford facility--though there is no suggestion of this from British Government sources or the port authorities, who say the agreement is still under negotiation.

"Last season the Poles in fact had a temporary seasonal fish transshipment arrangement on the British North Sea Coast. . . . But a more permanent arrangement, with a 500-ton freezer warehouse, is apparently sought this time.

"The in-and-out arrangement, under which Polish trawlers, paying normal port landing dues, would merely land fish into store for fairly rapid removal to Poland by refrigerator vessels, seems not to present any commercial difficulties. But deep-sea fishing has lately become a sensitive area between several Communist and Western countries."

Note: See Commercial Fisheries Review, March 1964 p. 66, February 1964 p. 80, and February 1963 p. 86.

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FISHERIES TRENDS, 1963:

Landings: Polish landings of salt-water fish amounted to 209,745 metric tons in 1963 as compared with 164,039 tons in 1962 and 169,135 tons in 1961. The Polish catch in 1963 included record landings of 91,000 tons from the Baltic Sea, as well as 85,000 tons

Table 1 - Polish Landings of Salt-Water Fish, 1963^{1/}

| Species | Total | State-Owned Fisheries | Cooperatives | Private Fishermen |
|-----------------------------------|------------|-----------------------|--------------|-------------------|
| (Metric Tons) | | | | |
| Salmon . . . | 331.3 | 7.3 | 244.0 | 80.0 |
| Eel | 154.5 | 6.8 | 19.4 | 128.3 |
| Baltic herring | 28,151.0 | 17,717.0 | 7,150.5 | 3,283.5 |
| North Sea herring. . . | 73,275.8 | 73,275.8 | - | - |
| Sprat | 10,732.2 | 7,173.8 | 1,315.7 | 2,242.7 |
| Cod | 57,475.9 | 39,005.5 | 10,878.0 | 7,592.4 |
| Flatfish . . . | 5,098.2 | 2,820.2 | 1,236.2 | 1,041.8 |
| Mackerel . . . | 5,453.3 | 5,453.3 | - | - |
| Ocean perch | 13,023.2 | 13,023.2 | - | - |
| Other salt-water fish . | 2/13,532.7 | 2/13,273.8 | 106.1 | 152.8 |
| Brackish-water fish . | 2,516.8 | - | 2,353.3 | 163.5 |
| Total | 209,744.9 | 171,756.7 | 23,303.2 | 14,685.0 |

^{1/}Preliminary.

^{2/}Includes catch off South Africa.

from the North Sea, and 32,000 tons from the Atlantic. The Polish catch in the Atlantic amounted to only 12,000 tons in 1962 and 205 tons in 1961.

Imports: Polish imports of fishery products in 1963 were up sharply from 1962, but the increase was largely due to heavier imports of fish meal. A gain in imports of salted herring in 1963 was partly offset by decline in imports of fresh and frozen herring.

Table 2 - Polish Imports of Fishery Products, 1956-1963

| Product | 1963 | 1962 | 1960 | 1958 | 1956 |
|-----------------------------------|--------|--------|--------|--------|--------|
| (Metric Tons) | | | | | |
| Mackerel, frozen | 568 | 500 | - | - | - |
| Herring, fresh and frozen . . . | 3,891 | 5,992 | 4,014 | 5,464 | 6,703 |
| Herring, salted. . . | 8,517 | 5,132 | 19,681 | 7,183 | 2,729 |
| Fish fillets | - | - | 1,419 | 2,009 | - |
| Conserves ^{1/} | 1,328 | 2,670 | 6,141 | 1,237 | 46 |
| Caviar | 10 | 10 | 10 | - | 15 |
| Fish meal | 30,000 | 13,000 | 6,406 | 1,487 | 3,121 |
| Total | 44,314 | 27,304 | 37,671 | 17,380 | 12,615 |

^{1/}Includes hermetically-processed canned pack and cold pack.

Exports: Polish exports of fishery products in 1963 were 55.6 percent above those in the previous year, due mainly to larger shipments of fresh and frozen fish.

Table 3 - Polish Exports of Fishery Products, 1963-1965

| Product | 1963 | 1962 | 1960 | 1958 | 1956 |
|--|-------|-------|-------|-------|-------|
| (Metric Tons) | | | | | |
| <u>Fresh and Frozen:</u> ^{1/} | | | | | |
| Salmon | 272 | 206 | 216 | 164 | 88 |
| Other salt-water fish | 4,270 | 405 | - | 2,000 | - |
| Carp | 380 | 379 | 546 | 497 | 486 |
| Other fresh-water fish | 892 | 933 | 852 | 746 | 948 |
| Smoked fish | 392 | 316 | 6 | - | 1 |
| Salted fish | 15 | 203 | 2,125 | - | - |
| Conserves ^{2/} | 3,414 | 3,733 | 2,807 | 1,155 | 1,661 |
| Shellfish | 32 | 36 | 30 | 52 | 30 |
| Total | 9,667 | 6,211 | 6,582 | 4,614 | 3,214 |

^{1/}Includes direct landings and sales in Ghana and Nigeria.

^{2/}Includes hermetically-processed canned pack and cold pack.

Overseas Bases: In 1963, the Polish fishery for herring in the North Sea was supported as usual by the motherships Kaszuby and Pulaski and the tender vessel Jastarnia. During periods of heavy catches, foreign vessels were chartered to serve as transport vessels. Overseas bases of a limited nature were also established. A transshipment base at the British port of North Shields was organized for the Polish fishing fleet during the summer of 1963. Polish vessels fishing off the southwest coast of Norway in late 1963 landed fresh herring in the Norwegian port of Haugesund for freezing and transshipment. The Belgian

Poland (Contd.):

port of Ostend was used in a similar manner by Polish vessels fishing in the English Channel during September-November 1963. (Polish Maritime News, No. 66.)

"SUPER TRAWLER" SINKS OFF ICELAND:

One of Poland's large fishing trawlers sank off the coast of Iceland this past April as a result of extensive bottom damage. The Wislok became grounded in shallow water the latter part of February. Salvage efforts by the Polish tug Coral, sent to the location of the grounded vessel to render assistance, were unsuccessful. The Wislok, described as a "super trawler" was of 600 gross tons and was built in Poland in 1958. (Unpublished source.)



Portugal

CANNED FISH EXPORTS, 1962-1963:

Portugal's total exports of canned fish during 1963 were down 5.5 percent from those in 1962, due to lower exports of sardines and anchovy fillets. The decline was partly offset by a considerable increase in exports of mackerel.

Sardines accounted for 75.2 percent of the 1963 exports of canned fish, followed by mackerel with 8.9 percent, anchovy fillets with 6.8 percent, tuna and tuna-like fish with 5.5 percent, and chinchards with 3.0 percent.

| Portuguese Canned Fish Exports, 1962-1963 | | | | |
|---|-------------|-------------|-------------|-------------|
| Product | 1963 | | 1962 | |
| | Metric Tons | 1,000 Cases | Metric Tons | 1,000 Cases |
| <u>In Oil or Sauce:</u> | | | | |
| Sardines | 53,484 | 2,815 | 59,102 | 3,110 |
| Chinchards | 2,134 | 112 | 2,054 | 108 |
| Mackerel | 6,323 | 253 | 4,258 | 170 |
| Tuna and tuna-like | 3,887 | 129 | 3,647 | 121 |
| Anchovy fillets | 4,811 | 481 | 5,832 | 583 |
| Others | 437 | 23 | 326 | 17 |
| Total | 71,076 | 3,813 | 75,219 | 4,109 |

Portugal's principal canned fish buyers during 1963 were Germany with 12,762 metric tons, followed by Italy with 11,778 tons, the United Kingdom 8,173 tons, the United States 7,168 tons, France 5,688 tons, and

Belgium-Luxembourg 4,679 tons. (Conservas de Peixe, February 1964.)

CANNED FISH PACK, 1962-1963:

Portugal's total pack of canned fish in oil or sauce in 1963 was down 7.7 percent from that in 1962, due mainly to a drop in the pack of sardines. The packs of mackerel and an-

| Portuguese Canned Fish Pack, 1962-1963 | | | | |
|--|-------------|-------------|-------------|-------------|
| Product | 1963 | | 1962 | |
| | Metric Tons | 1,000 Cases | Metric Tons | 1,000 Cases |
| <u>In Oil or Sauce:</u> | | | | |
| Sardines | 49,644 | 2,613 | 54,632 | 2,875 |
| Chinchards | 3,363 | 177 | 2,816 | 148 |
| Mackerel | 6,736 | 269 | 7,566 | 302 |
| Tuna and tuna-like | 5,907 | 197 | 5,399 | 180 |
| Anchovy fillets | 4,170 | 417 | 5,244 | 524 |
| Others | 600 | 32 | 661 | 35 |
| Total | 70,420 | 3,705 | 76,318 | 4,064 |

chovy fillets were also down. There were modest gains in the packs of chinchards and tuna and tuna-like fish. (Conservas de Peixe, February 1964.)

LOAN FUND TO RENOVATE FISHING FLEET:

As has been done periodically since 1959, the Portuguese Treasury has been authorized to extend a further credit of 50,000 contos (US\$1,750,000) to the Fund for the Renovation and Equipping of the Fishing Industry. The credit, bearing 4 percent annual interest, brings the total amount so lent in the past 5 years to \$14.7 million.

The high rate of obsolescence in the Portuguese fishing fleet and the increasing difficulty in supplying the domestic as well as the export market are of continuing concern to the Portuguese Government. Exports of canned fish accounted for 9.2 percent of Portugal's total exports during 1963, but periodic shortages of fresh fish in local markets have caused complaints, especially among those who can afford little meat. (United States Embassy, Lisbon, March 28, 1964.)



Somalia Republic

FISH-PROCESSING AND FREEZING PLANT TO BE BUILT IN ALULA AS JOINT U. S.-SOMALI VENTURE:

An agreement to establish a joint fish-freezing, processing, and marketing operation in Alula, in the northern part of Somali, was recently concluded by a local fisheries firm which is a subsidiary of a large United States fishery products processor and distributor. The plant is expected to cost about \$1 million and will be operated on an equal share investment basis. The agreement was signed on March 11, 1964, and is subject only to final approval of the respective boards of directors of the parent companies. The investment is covered by the U. S. Investment Guaranty Program and the Somali Foreign Investment Law which grants the enterprise a 10-year moratorium on income taxes. (United States Embassy, Mogadiscio, March 23, 1964.)



Surinam

FOUR NEW SHRIMP VESSELS DELIVERED TO JAPANESE FIRM IN SURINAM:

Four new steel shrimp vessels built by a shipyard in Rockport, Tex., are now engaged in the shrimp fishery off Surinam. The vessels were delivered in early 1964 to a Japanese firm in South America with headquarters in the port of Paramaribo.

Plans for the new vessels were drawn by a naval architect in Vancouver, B.C., Canada. His double-rig design was an adaption of a Bering Sea trawler built to operate in rough weather.

The Surinam shrimp fishery lies off the delta of the Orinoco River. A number of United States shrimp vessels also are fishing in the area under contract. (National Fisherman, April 1964.)



Taiwan

FISHERIES TRENDS, FEBRUARY 1964:

Tuna: Early this year, 36 small tuna long-line vessels left Taiwan for Malaysia where they will fish out of Penang, and 10 larger

tuna vessels sailed for American Samoa where they will fish for a United States cannery. Taiwan's tuna vessels are also operating in the Indian Ocean.

Sardines: Philippine buyers are reported to be considering Taiwan as a source of canned sardines. The annual catch of sardines in Taiwan exceeds 30,000 metric tons. Taiwan canneries are experimenting with using aluminum cans instead of tin cans for sardine packing. (Taiwan Industrial Panorama, February 29, 1964.)



Tunisia

FISHERIES TRADE WITH EAST GERMANY:

The Chief of the Fisheries Department of Tunisia departed Tunis on April 1, 1964, for a visit to France, Italy, and East Germany. He stated that his visit to East Germany would include negotiations on the sale of 1,000 metric tons of fish meal fertilizer as part of a commercial exchange agreement. He also said that shipyards in the Baltic (presumably East Germany) are building 10 steel trawlers of standard design for Tunisia, with the purchase price payable in 5 years. (United States Embassy, Tunis, April 17, 1964.)



Turkey

12-MILE FISHERIES LIMIT CONSIDERED:

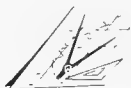
On April 10, 1964, the Turkish House of Representatives discussed and approved on a priority basis the draft bill enlarging Turkish territorial waters from 3 to 6 miles, with fishing rights reserved out to 12 miles. The bill has been submitted to the Turkish Senate. If approved, it will come into force three months after promulgation in the Official Gazette.

Turkey's Black Sea neighbors and the United Arab Republic on the Mediterranean Sea have proclaimed 12-mile territorial waters. Other Mediterranean countries claim territorial waters extending for six miles.

The new Turkish bill also stipulates that, in case a country imposes wider territorial waters and fishing rights against Turkey, it

Turkey (Contd.):

will reciprocally apply the larger margin. (United States Embassy, Ankara, April 22, 1964.)



U.S.S.R.

SOVIET FISHING VESSELS RETURN TO NORTHWEST ATLANTIC:

In late April 1964, about 60 Soviet fishing vessels were sighted fishing for whiting off the New England coast of the United States. The fleet consisted of refrigerated transports, factory stern trawlers, and medium-class side trawlers. It was located in the vicinity of Lydonia Canyon about 130 miles east of Nantucket Island, Mass.

The number of Soviet vessels fishing along the New England coast reached a high of 300 during the summer of 1963.

The Soviet Union is one of 13 nations signatory to the International Convention for the Northwest Atlantic Fisheries. The only fish presently under the regulation of that Convention are haddock and cod. The size of mesh in nets used for the taking of those two species is prescribed by regulation, but the meshsize of nets used in taking other species is at the discretion of the fishermen.

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FISHING FOR TUNA IN SOUTH CHINA SEA:

The Soviet Union is conducting experimental trawl and tuna fishing in the South China Sea with a fleet of four vessels, which include a seiner and a research vessel, according to

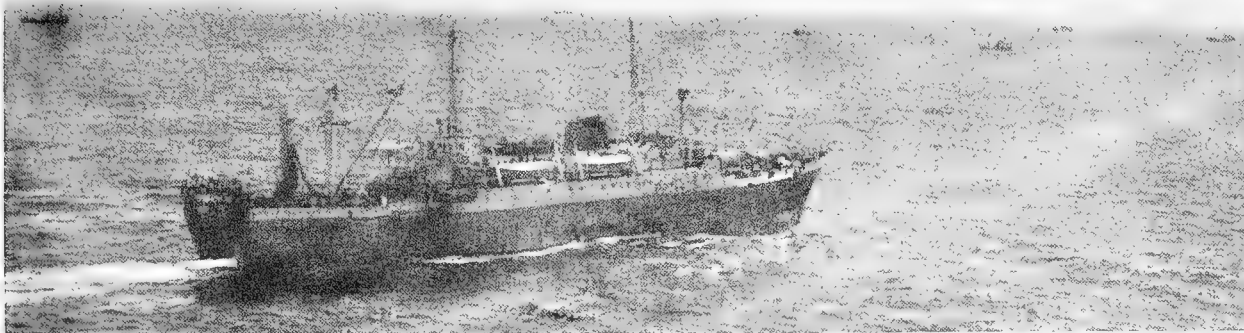
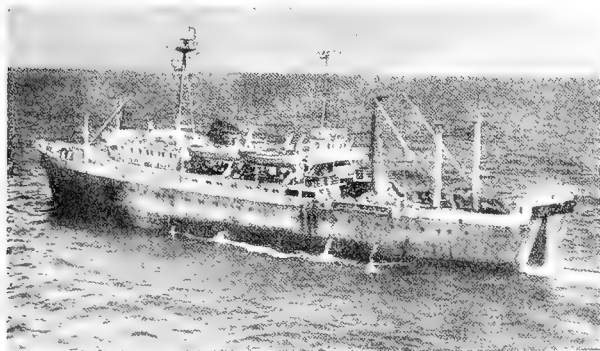


Fig. 1 - Soviet fishing fleet off Cape Cod.

During the previous three years there was major Soviet fishing activity in the Northwest Atlantic, although few foreign vessels had been sighted in the area since November 1964.



Close up of Soviet stern factory trawler fishing off New England.

a Soviet press report dated April 7, 1964. This development is interpreted in Japan as the beginning on the part of the Soviet Union, which is now awaiting delivery of the tuna vessels it has placed on order with foreign firms, to engage in full-scale tuna fishing in the Pacific Ocean. (U.S.S.R. is reported to have on order from Japan five 5,000-ton class tuna factoryships.) (Suisancho Nippo, April 17, 1964.)

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FISHING FLEETS OPERATING OFF U. S. COASTS IN 1963:

North Pacific and Bering Sea: A total of about 400 Soviet fishing vessels, at one time or another, fished in the North Pacific and Bering Sea during 1963. The peak number of fishing vessels at one time was about 200, the same as in 1962. But in 1963 most of the vessels were in the Gulf of Alaska rather than in the Bering Sea, and in July instead of in June. For the first time, the increased Soviet fishing effort in the

U.S.S.R. (Contd.):

Gulf of Alaska was augmented by entry into the king crab fishery. In June and July of 1963 at least two crab factoryships were reported south of Kodiak Island. By the end of July those factoryships had left the area to fish saury off the Kurile Islands in the western North Pacific Ocean. In 1963 (also for the first time) several large Soviet stern trawlers were reported operating off the western Aleutian Islands.

Five Soviet whaling fleets, with about 50 accompanying whale killers, operated mostly along the Aleutian Islands chain and eastward to southeast of Kodiak Island. Another whaling fleet operated in the Aleutian area while en route to Siberia from the Antarctic Ocean.

Ocean perch, herring, flatfish, Alaska pollock, Pacific cod, sablefish, and king crab were reported to have been caught. Unconfirmed reports indicate that the Soviet fleets in the area may have caught some shrimp. Soviet sources reported in early October that good catches of halibut and sablefish had been made by a research trawler operating in the Bering Sea in deep waters between 200 and 350 fathoms, but the exact location was not given.

Other Areas in the Pacific: No Soviet commercial fishery has as yet been reported off the coasts of Washington, Oregon, and California. As in 1962, a few Soviet exploratory fishing vessels appeared in that area during the summer and early fall. Some of them were also reported off the coast of British Columbia, Canada.

In May 1963, a Soviet whaling fleet with about 20 whale catchers was reported 200 to 300 miles off the coast of Washington and British Columbia. That fleet was actively whaling and was the same fleet, en route from the Antarctic, which was later reported whaling in the Aleutian Islands area.

Northwest Atlantic (Georges Bank): Soviet fishing on Georges Bank off the New England coast ceased in mid-November 1962, and resumed in force in June 1963 with a fleet of about 185 vessels. A peak number of over 200 Soviet vessels was reported operating on Georges Bank in August. Herring and whiting were the major species caught. Smaller quantities of haddock and cod, mostly caught incidentally to whiting, were also caught. Other species fished were ocean perch, flounder, halibut, and other bottomfish.

Middle and South Atlantic Coasts: Soviet stern trawlers and side trawlers fished off the United States east coast from Nantucket Island to Florida. The peak number of Soviet vessels fishing that area was estimated at about 40. Whiting and herring are known to have been taken. Other species believed to be of interest to the Soviets included menhaden, tuna, and shrimp.

Gulf of Mexico and Caribbean Sea: It was reported that 20 to 30 Soviet trawlers operated out of Cuba in 1963. The Soviets expect ultimately to have about 130 vessels operating out of Cuban ports where they will obtain maintenance, repair, and supply services. Also during 1963 a number of Soviet vessels stopped in Mexican and Caribbean ports for supplies.

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FISHERIES DEVELOPMENT HAMPERED:

Soviet fisheries development is being held back by faulty planning. That was the conclusion of an editorial in the newspaper *Pravda*, Moscow, March 19, 1964. In spite of the increased Soviet fisheries catch (from about 3.1 million metric tons in 1959 to an estimated 4.5 million tons in 1963), the editorial claimed that the Soviet fishing fleet had reserves which were not being properly used.

The Soviet catch goal set for 1965 is 5.5 million tons, according to the British periodical *Fishing News*, March 6, 1964.

Pravda stated that much time was being lost by the North Atlantic fishing fleet because it had not been supplied with sufficient packing material. The administrative level was charged with failure to plan properly for the needed cartons, barrels, and wooden crates.

The Soviet newspaper also pointed out that new areas of the fishing industry were being developed too slowly. Specific examples cited were: (1) lengthy experiments in tuna and mackerel fishing in the Pacific; (2) drawn-out discussions of ways to organize a fishery for Greenland halibut (*Reinhardtius hippoglossoides*) in the North Atlantic; and (3) lack of expansion effort in the fisheries for shrimp, mussel, and other shellfish items.

Pravda further stated that Soviet port facilities had not kept pace with growth in the fishing fleet. A shortage of repair facilities and refrigeration vessels was also mentioned.

The editorial concluded with the following statement: "The 22nd Soviet Communist Party Congress (in 1961) set the task--within the next 10 years--to increase substantially the growth of the per capita use of products, including fish and fish products... This obligates the fishing industry to begin using reserves and the potential more quickly, to increase steadfastly the fish catch, to improve its quality, and to lower the cost of the wealth from oceans and seas."

* * * * *

SALMON CATCH, 1963:

The Soviet Union landed in 1963 a total of 81,070.8 metric tons of salmon, according to

| U.S.S.R. Catch of Salmon by Areas, 1963 | | | | | | |
|---|---------------------------|----------|----------|---------|---------|----------|
| Area | Species | | | | | |
| | Red | Chum | Pink | Silver | King | Total |
| | (Metric Tons) | | | | | |
| West Kamchatka . | 2,538.4 | 1,237.9 | 5,062.9 | 4,803.7 | 187.8 | 13,830.7 |
| East Kamchatka . | 894.8 | 6,774.8 | 13,655.4 | 2,442.7 | 815.5 | 24,583.2 |
| Sakhalin-Kurile Is. | - | 1,406.3 | 5,329.7 | - | - | 6,736.0 |
| Okhotsk Region .. | 8.8 | 8,527.0 | 5,542.2 | 93.7 | - | 14,171.7 |
| Northern Okhotsk. | - | 1,780.0 | 3,780.0 | 13.0 | - | 5,573.0 |
| Amur | - | 13,839.7 | 832.9 | - | - | 14,672.6 |
| Maritime Province | - | - | 1,503.6 | - | - | 1,503.6 |
| Total | 3,442.0 | 33,565.7 | 35,706.7 | 7,353.1 | 1,003.3 | 81,070.8 |

data released by the Japanese Fisheries Agency. (*Suisancho Nippo*, March 21, 1964.)

United Kingdom

TWO BRITISH-BUILT PURSE-SEINE VESSELS ACQUIRED BY CHILEAN COMPANY:

The Amanzule and Asuokaw, two tuna purse-seine vessels built in a British shipyard for the Ghana Fishing Corporation several years ago, have changed their names and ownership. Now known as La Patria and Flor de Chile, they have been acquired by a Chilean fishing company and will be based at Iquique in northern Chile after a 7,000-mile delivery trip. The vessels had been out of commission at Hull, England, for about a year.

The future of two other purse-seiners built in Britain for Ghana is still uncertain. Both vessels are now in England. One, the Fawn-

pawn, is at Hull and the other, the Kpeshie, is at Appledore.

Commenting on West African fishing methods, a representative of a trawler company who was in Ghana when the Amanzule and Asuokaw were fishing there said, "The tuna fish in West African waters are more easily caught by long-lining rather than by purse-seining, which is the method used by these vessels... ."

The 4 tuna purse-seiners built for the Ghana Fishing Corporation were part of an order for 6 vessels. The other two vessels, which are stern trawlers, are still in service in Ghana. (The Fishing News, March 13, 1964.)

Note: See Commercial Fisheries Review, November 1963 p. 63.



DISTRIBUTION AND MOVEMENTS OF FUR SEALS

The northern fur seal, an abundant and widely ranging mammal, is seldom observed alive except by fishermen and seamen working offshore or by visitors to the Alaskan and Asian Islands where the seals breed.

Originally the fur seals that breed on the Pribilof Islands, on the Commander Islands, and on Robben Island and some of the Kurile Islands (Pribilof Islands are U. S. territory; Commander, Robben, and Kurile Islands are under the administration of the U. S. S. R.) were described as three separate species because of supposed differences in color and in shape of head and neck. They have since been found to be indistinguishable by physical appearance and measurements; their wintering grounds overlap; and tagged seals, especially young males, are regularly found in small numbers on rookery islands other than where born. Therefore, the fur seals of the North Pacific are now considered to belong to a single species, Callorhinus ursinus.

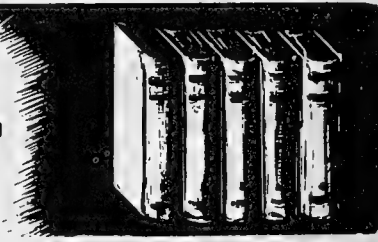
Except as stragglers, few fur seals range north of the Pribilof Islands. They migrate south to the Channel Islands off Santa Barbara, Calif. In the west they range from the vicinity of the Commander Islands to the seas southwest of Kinkazan Peninsula on northern Honshu and into the Sea of Japan.

Fur seals breed on the following islands: St. Paul and St. George Islands and Sea Lion Rock of the Pribilof group in Alaska; Copper and Bering Islands of the Commander group off Kamchatka; Robben Island, off Sakhalin; Kotikovaya Rock and Srednevoya Island in the Kurile Chain of Islands. Seals were also reported by the Soviet Institute of Oceanology to be on the Kurile Islands, Paramushir and Urup, but no pups were seen. Fur seals of the Kurile Islands were thought to be exterminated by sealers in the 1890's; however, in 1955 and 1956, investigations revealed their presence once again, in small numbers. About 80 percent of the northern fur seals are from the Pribilof Islands.

--Excerpted from:
The Northern Fur Seal, Circular 169,
U. S. Bureau of Commercial Fisheries,
Washington, D. C.



FEDERAL ACTIONS



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

CANNED TUNA STANDARD OF IDENTITY AMENDED:

The Commissioner of the U. S. Food and Drug Administration signed an order April 10, 1964, adopting a proposed amendment to the standard of identity for canned tuna. The amendment will permit the use of sodium acid pyrophosphate as an optional ingredient to prevent the formation of struvite.

The order as published in the Federal Register, April 16, 1964, follows:

Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER B—FOOD AND FOOD PRODUCTS

PART 37—FISH; DEFINITIONS AND STANDARDS OF IDENTITY; STANDARDS OF FILL OF CONTAINER

Canned Tuna; Order Listing Sodium Acid Pyrophosphate as Optional Ingredient

In the matter of amending the standard of identity for canned tuna (21 CFR 37.1) by listing sodium acid pyrophosphate in an amount not to exceed 0.15 gram per ounce, net weight, as an optional ingredient of canned tuna for inhibiting the development of struvite crystals in the food:

The notice of proposed rule making in the above-identified matter published in the FEDERAL REGISTER of February 6, 1964 (29 F.R. 1807) elicited only one comment, which favored the proposal. Therefore, in consideration of the information furnished in the petition, the comment received, and other relevant information available, it is concluded that it would promote honesty and fair dealing in the interest of consumers to amend the definition and standard of identity for canned tuna as hereinafter set forth. Pursuant to the authority vested in the Secretary of Health, Education, and Welfare by the Federal Food, Drug, and Cosmetic Act (secs. 401, 701,

52 Stat. 1046, 1055 as amended 70 Stat. 919; 21 U.S.C. 341, 371) and delegated to the Commissioner of Food and Drugs by the Secretary (21 CFR 2.90; 29 F.R. 471): *It is ordered*, That § 37.1 be amended as set forth below:

Paragraph (a) is amended; and paragraph (h) is amended by redesignating subparagraph (7) as (8) and by inserting a new subparagraph (7). As amended, the affected portions of the section read as follows:

§ 37.1 Canned tuna; definition and standard of identity; label statement of optional ingredients.

(a) Canned tuna is the food consisting of processed flesh of fish of the species enumerated in paragraph (b) of this section, prepared in one of the optional forms of pack specified in paragraph (c) of this section, conforming to one of the color designations specified in paragraph (d) of this section, in one of the optional packing media specified in paragraph (e) of this section, and may contain one or more of the seasonings and flavorings specified in paragraph (f) of this section. For the purpose of inhibiting the development of struvite crystals, sodium acid pyrophosphate may be added in a quantity not in excess of 0.5 percent by weight of the finished food. It is packed in hermetically sealed containers and so processed by heat as to prevent spoilage. It is labeled in accordance with the provisions of paragraph (h) of this section.

(h)

(7) Where the canned tuna contains the optional ingredient sodium acid pyrophosphate as provided in paragraph (a) of this section, the label shall bear the statement "pyrophosphate added" or "with added pyrophosphate."

(8) Wherever the name of the food appears on the label so conspicuously as to be easily seen under customary conditions of purchase, the names of the optional ingredient used, as specified in subparagraphs (3), (6), and (7) of this paragraph, shall immediately and conspicuously precede or follow such name, without intervening, written, printed, or graphic matter, except that the common name of the species of tuna fish used may so intervene; but the species name "albacore" may be employed only for canned tuna of that species which meets the color designation "white" as prescribed by paragraph (d)(1) of this section.

Any person who will be adversely affected by the foregoing order may at any time within 30 days from the date of its publication in the FEDERAL REGISTER file with the Hearing Clerk, Department of Health, Education, and Welfare, Room

5440, 330 Independence Avenue SW., Washington, D.C., 20201, written objections thereto, preferably in quintuplicate. Objections shall show wherein the person filing will be adversely affected by the order and specify with particularity the provisions of the order deemed objectionable and the grounds for the objections. If a hearing is requested, the objections must state the issues for the hearing, and such objections must be supported by grounds legally sufficient to justify the relief sought. Objections may be accompanied by a memorandum or brief in support thereof.

Effective date. This order shall become effective 60 days from the date of its publication in the FEDERAL REGISTER, except as to any provisions that may be stayed by the filing of proper objections. Notice of the filing of objections or lack thereof will be announced by publication in the FEDERAL REGISTER.

(Secs. 401, 701, 52 Stat. 1048, 1055 as amended 70 Stat. 919, 21 U.S.C. 341, 371)

Dated: April 10, 1964.

GEO. P. LARRICK,
Commissioner of Food and Drugs.



Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

PROPOSALS FOR PROCESSING, PROMOTING, AND SELLING ALASKA SEALSKINS:

Four firms submitted proposals for processing, promoting, and selling Alaska sealskins for the account of the United States Government, the Department of the Interior announced on April 15, 1964. Two other firms submitted proposals only for selling finished sealskins.

Firms submitting proposals for processing sealskins were required to submit samples of their workmanship in converting raw sealskins into finished luxury furs, using raw sealskins provided by the U. S. Bureau of Commercial Fisheries.

A comprehensive evaluation was undertaken to determine the relative quality of the sample sealskins submitted by firms seeking the processing contract. This was expected to be completed by mid-June and the start of contract negotiations was expected to be about July 1, 1964. A new contract, or contracts, for processing and selling Alaska sealskins for the Federal Government should be arranged by midsummer 1964.

The quality evaluation of the sample furs was based primarily on a 3-phase program: Evaluation by a panel of experts from 5 Department of the Federal Government; physical and chemical tests to be conducted by the National Bureau of Standards; and marketability study based on garments manufactured from the sample sealskins.

The fur seal herds of the Pribilof Islands, Alaska, are managed under the terms of a treaty to which Japan, Canada, the U. S. S. R., and the United States are parties. An amendment to the treaty was ratified April 10, 1964, extending its duration to 1969. Under treaty protection, the Pribilof seal herd has increased to its present estimated size of 1,500,000 animals, from which a substantial annual harvest can be anticipated on a continuing basis.

* * * * *

EMERGENCY FISHERY LOAN OFFICE OPENED IN ALASKA:

An emergency office was opened in Kodiak, Alaska, in April 1964, to arrange for loans to fishing vessel owners in the Kodiak area whose vessels or fishing gear were lost or damaged during the March earthquake. The April 8 announcement by Secretary of the Interior Stewart L. Udall, of the opening of an emergency office there, followed a recommendation made by Under Secretary of the Interior James K. Carr who had been on an inspection trip of the disaster area.

The emergency office was open for business on April 11 and was headed by the Chief of the Branch of Loans and Grants, Bureau of Commercial Fisheries, in Washington, D. C. Arrangements were made for immediate processing of loan applications so that vessels could be made ready for the approaching fishing season in that area. The Bureau's Alaska Loan Office in Juneau was also prepared to receive applications for priority action. Similar offices were to be set up in other localities if conditions warranted the establishment of such emergency offices.

This emergency action was taken under the Secretary's authority to operate a fisheries loan program which permits loans for financing and refinancing operations, maintenance, repair, replacement, and equipment of fishing vessels and gear.

* * * * *

WHALING LICENSES ON PACIFIC COAST:

Notice of a delegation of authority within the Bureau of Commercial Fisheries concerning the issuance of licenses relating to whaling on the Pacific Coast was published in the Federal Register, April 9, 1964. The notice stated, "(a) The authority to execute, on behalf of the Bureau of Commercial Fisheries, annual licenses required for whale catchers and whale land stations conducting whaling operations along the Pacific Coast, is hereby delegated to the Regional Director, Pacific Northwest Region (Region 1), Bureau of Commercial Fisheries, Seattle, Washington. (b) The authority delegated in section (a) may not be redelegated by the Regional Director."



U. S. Tariff Commission

GROUND FISH FILLETS RESERVED FROM TRADE-AGREEMENT NEGOTIATIONS:

Groundfish fillets (cod, cusk, haddock, hake, pollock, and Atlantic ocean perch, under Tariff Schedules of the United States Item Nos. 110.50 and 110.55) will be reserved from the President's list of articles up for tariff modification in the forthcoming trade negotiations under the General Agreement on Tariffs and Trade.

The determination was contained in a U.S. Tariff Commission report to the President on April 22, 1964, stating that economic conditions have not substantially improved in the industry since the Commission found on May 7, 1954, and October 12, 1956, that groundfish fillets were being imported into the United States in such increased quantities as to cause serious injury to the domestic industry producing like or directly competitive products.

The Tariff Commission's report on April 22, 1964, contained the results of its investigations numbered TEA-225(b)-1 to 15 under section 225(b) of the Trade Expansion Act of 1962. Under conditions set forth in section 225(b), certain articles included in the President's list furnished to the Commission on October 22, 1963, pursuant to section 221 of the Trade Expansion Act, must be reserved from negotiation for the reduction of duty or other import restriction or the elimination of duty. This reservation provision applies to any article with respect to which (1) the Commission in escape-clause proceedings concluded prior to October 11, 1962, found by majority vote that such article was being imported in such increased quantities as to cause or threaten serious injury to an industry; (2) there was not in effect on October 11, 1962, any action taken under section 7 of the Trade Agreements Extension Act of 1951; (3) a request for reservation on behalf of the industry concerned is filed with the Commission not later than 60 days after publication of the President's list; and (4) the Commission finds and advises the President that economic conditions in such industry have not substantially improved since the date of the report of the finding referred to in (1). (U. S. Tariff Commission, Washington, D. C., April 22, 1964.)

The announcement of the Tariff Commission's report to the President was published in the April 28, 1964, Federal Register.



Department of the Treasury

BUREAU OF CUSTOMS

IMPORTS OF TUNA CANNED IN BRINE UNDER QUOTA PROVISIO FOR 1964:

The quantity of canned tuna in brine which may be imported into the United States during calendar year 1964 at the 12½ percent rate of duty is limited to 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). This is 3.5 percent less than the 63,130,642 pounds (about 3,006,221 standard cases) in 1963; but 3.1 percent more than the 59,059,014 pounds (about 2,812,000 standard cases) in 1962; 6.6 percent more than the 57,114,714 pounds in 1961; 14.0 percent more than the 53,448,330 pounds in 1960; and 16.3 percent more than the 52,372,574 pounds in 1959. Any imports in excess of the 1964 quota will be dutiable at 25 percent ad valorem.

The quota, which was issued pursuant to the provisions of Item 112.30, Tariff Schedules of the United States, is limited to 20 percent of the United States pack of canned tuna during the preceding year.

A proclamation (No. 3128), issued by the President on March 16, 1956, gave effect to an exchange of notes with the Government of Iceland to withdraw tuna canned in brine from the 1943 trade agreement and invoked the right to increase the duty reserved by the United States in negotiations with Japan and other countries under the General Agreement on Tariffs and Trade.

The 1964 tariff-rate quota was published in the Federal Register, page 5405, April 22, 1964, by the Bureau of Customs of the U. S. Department of the Treasury.

Note: See Commercial Fisheries Review, May 1963 p. 47.



Eighty-Eighth Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



ALASKA CLAIMS COMMISSION: Three nominations to the Temporary Alaska Claims Commission were confirmed by the Senate on May 5, 1964.

ALASKAN DISASTER: See heading "Fisheries Legislation" for report on House hearings on this subject.

On April 20, 1964, Senator Gruening spoke from the floor of the Senate inserting in that day's Congressional Record, (pages 8176-8177), additional news article concerning the earthquake damage in Alaska.

Senator Bartlett addressed the Senate on April 20, 1964 (Congressional Record, pages 8198-8199), expressing the appreciation of the Alaskans for the generosity of Americans in their contributions.

Senator Gruening spoke from the floor of the Senate on the subject of interest rates on small business loans in the Alaska disaster area on several occasions: on April 21, 1964 (Congressional Record, pages 8349-8350), his remarks included a letter from the Senator to the Administrator of the Small Business Administration; on April 22, 1964 (Congressional Record, pages 8412-8413), his remarks included an article concerning Alaskan coastline changes caused by the earthquake; and on April 29, 1964 (Congressional Record, pages 9238-9239), his remarks included an exchange of letters between the Senator and the Administrator of the Small Business Administration.

Senator Bartlett spoke from the floor of the Senate on April 22, 1964, discussing effects of the Alaskan earthquake. He also included a newspaper article on Alaskan coastline changes by the earthquake in his remarks (Congressional Record, pages 8481-8482); and on May 13, 1964 (Congressional Record, pages 10479-10480), his remarks included an editorial ("Alaska Aid") published in the May 11, 1964, issue of the Seattle Post-Intelligencer.

On May 1, 1964, Senator Gruening spoke from the floor of the Senate and inserted in that day's Congressional Record (pages 9468-9469) an address by Senator Anderson to the Anchorage, Alaska, Chamber of Commerce concerning the Alaskan disaster relief programs.

Senator Hartke on May 1, 1964, under an extension of remarks inserted in that day's Congressional Record (page A2212) a resolution of support adopted by the Indiana State Bar Association for S. 2719, a bill to provide relief to individuals who suffered substantial economic losses in the Alaska earthquake disaster.

On May 12, 1964, Senator Bartlett from the floor of the Senate inserted in that day's Congressional Record (page 10264) a speech by the Administrator of the Small Business Administration (SBA) given May 10, 1964, in Fairbanks, Alaska. The Administrator's speech contained references to the fishing industry and he stated in part, "The fishing industry is of course essential to Alaska's economy, and here again, Federal programs are being coordinated as a means of giving all possible help. The SBA and the Fish and Wildlife Service of the Department of the Interior are conducting a joint program of assistance. Under the law which governs most of SBA's operations, a fisherman whose boat was lost or damaged in the disaster is eligible for an SBA loan to charter a boat for the fishing season or until he can repair or replace his damaged boat. The SBA loan also may be used for travel ex-

penses to the 'lower 48' to select a replacement boat and return it to the Alaskan fishing grounds, and for operating capital during the fishing season. Our Agency also may make loans to repair or replace commercial boats damaged or destroyed by the disaster. However, under the present arrangement between agencies, the Interior Department is making the loans for this purpose. If and when that Department can no longer make the loans, or if for any reason it cannot help with the needs of a particular fisherman, then the SBA will step in and provide assistance. . . ."

ALASKA OMNIBUS ACT AMENDMENTS: S. 2772 (Jackson et al) introduced in the Senate April 25, 1964, to amend the Alaska Omnibus Act; referred to the Committee on Interior and Insular Affairs. In introducing the bill Senator Jackson said in part, "The Alaska Omnibus Act (P. L. 86-70) was enacted following Alaska's admission to statehood to assist that State perform certain functions which had previously been borne by the Federal Government. A total of \$28,500,000 of 'transitional' grants to Alaska were authorized to help her assume her responsibilities as a State. "The severe earthquake which struck Alaska on March 27 has prompted the President to offer these amendments. The previously authorized transitional grants will expire on June 30, 1964. . . . The earthquake has, in effect, delayed the day when Alaska can be expected to complete an orderly transition to full statehood responsibilities. The disaster will reduce Alaska's revenues below the level required to finance its increased functions as a State. To fill the gap, section 1 of the proposed bill would provide for a continuation of the transitional grants until June 30, 1966, and an authorization of \$22,500,000 for such grants. While the earlier grants were based largely on the amounts the Federal Government would have spent on the programs assumed by Alaska, the proposed grants are based on an estimate of the amounts by which State and local revenues will fall short of expectations because of the earthquake, together with certain funds required to meet extraordinary operating expenses. . . ." (Congressional Record, page 8792.) Other sections of the proposed legislation would extend certain other features of the original transition program.

H. R. 11037 (Aspinall) and H. R. 11038 (Rivers), introduced in the House April 27, 1964, to amend the Alaska Omnibus Act; both referred to the Committee on Interior and Insular Affairs, similar to S. 2772.

The Senate Committee on Interior and Insular Affairs on May 4, 1964, favorably reported (S. Rept. 1020), with amendment S. 2772.

S. Rept. 1020, Alaska Earthquake Grants (May 4, 1964, report from the Committee on Interior and Insular Affairs, United States Senate, 88th Congress, 2nd Session), 8 pp., printed. The Committee favorably reported with amendment S. 2772, to amend the Alaska Omnibus Act, and recommended passage. Contains explanation of the bill, which would add an additional \$23.5 million to the transitional grants of \$28.5 million authorized by the 1959 statute for the new State and extend the time in which the Federal Government may continue to provide services that customarily are a State function. Also gives background facts, executive communications, and changes in existing law.

On May 6, 1964, the House Committee on Interior and Insular Affairs held a hearing on H. R. 11037. The Committee heard testimony from Governor Egan of Alaska, and a public witness.

On May 13, 1964, the Senate passed, with Committee amendments, S. 2772 to amend the Alaska Omnibus Act. The bill would provide for a continuation of the transitional Federal grants to Alaska until June 30, 1966. The Committee amendment raised the authorization from \$22.5 million to \$23.5 million. Senator Jackson's remarks on the bill appear in that day's Congressional Record (pages 10483-10485).

On May 13, 1964, the House Committee on Interior and Insular Affairs ordered favorably reported amended to the House H. R. 11037, the Alaska Omnibus Act (H. Rept. No. 1410).

ALASKAN RECONSTRUCTION OFFICE: The Senate Committee on Interior and Insular Affairs continued hearings on May 4, 1964, on S. 2719, to amend the Alaska Statehood Act to provide for earthquake insurance retroactive to the date of Alaska statehood and establish Office of Alaska Reconstruction. On May 5, 1964, the Senate Committee on Interior concluded hearings.

ANADROMOUS FISH CONSERVATION: H. R. 11160 (Tupper), introduced in the House May 6, 1964, a bill to authorize the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several States; referred to the Committee on Merchant Marine and Fisheries. This bill is similar to H. R. 2392, which was endorsed, with recommended amendments by the Department of the Interior. Estimated cost of the expanded program would be built up to more than \$8 million by 1968.

ANTIDUMPING ACT AMENDMENT: H. R. 10978 (McMillan), introduced in the House April 21, 1964, to amend the Antidumping Act, 1921; also H. R. 11005 (Byrne) introduced in the House on April 22, and H. R. 11116 (Morgan) introduced in the House May 4; referred to the Committee on Ways and Means. Similar or identical to bills previously introduced.

CALIFORNIA CANNING INDUSTRY: Senator Kuchel, on April 22, 1964, spoke from the floor of the Senate on the accomplishments of the California canning industry, as indicated by a recent study sponsored by the National Canners Association. The study included references to the California fish-canning industry. (Congressional Record, page 8480.)

CHEMICAL PESTICIDES COORDINATION: The House Committee on Merchant Marine and Fisheries on April 21, 1964, in executive session ordered reported favorably (H. Rept. 1339) to the House H. R. 4487 (amended), to amend the Act of August 1, 1958, in order to prevent or minimize injury to fish and wildlife from the use of insecticides, herbicides, fungicides, and pesticides.

H. Rept. 1339, To Prevent or Minimize Injury to Fish and Wildlife from the Use of Insecticides, Herbicides, Fungicides, and Other Pesticides (April 23, 1964, Report from the Committee on Merchant Marine and Fisheries, House of Representatives, 88th Congress, 2nd Session, to accompany H. R. 4487), 11 pp., printed. The Committee reported the bill with amendments and recommended passage. Contains purpose of the bill, background of the legislation, section-by-section analysis, discussion of the amendments, cost of the legislation, Federal Agency comments, and changes in existing law.

On May 12, 1964, the Senate Committee on Commerce met in executive session and ordered reported favorably S. 1251 (with an amendment in the nature of a substitute)--this bill similar to H. R. 4487. The present appropriation authorization for Interior studies on the effects of insecticides is limited to \$2,565 million. This bill would raise that authorization to \$3.2 million for the first year and \$5.0 million thereafter.

COMMERCIAL FISHERIES FUND: See under heading "Fisheries Legislation" for report on House hearings on bills on this subject.

The House Committee on Merchant Marine and Fisheries on April 21, 1964, met in executive session and ordered reported favorably (H. Rept. 1363), to the House S. 627 (amended), to promote State commercial fishery research and development projects and for other purposes.

H. Rept. 1363, Promoting State Commercial Fishery Research and Development Projects (April 28, 1964, Report from the Committee on Merchant Marine and Fisheries, House of Representatives, 88th Congress, 2nd Session, to accompany S. 627), 20 pp., printed. The Committee reported the bill with amendments and recommended passage. Contains purpose of the bill, need for the legislation, background of the legislation, section-by-section analysis, the amendments, cost of the legislation, conclusion, departmental reports, changes in existing law, and loan procedures.

On May 4, 1964, the House passed with amendments S. 627. The text of the bill as passed by the House appears in the Congressional Record (pages 9651-9658).

On May 6, 1964, the Senate concurred with House amendments to S. 627. This action cleared the legislation for the President. The amended legislation authorizes the Secretary of the Interior to cooperate with the States through their respective State agencies in carrying out projects designed for the research and development of the commercial fisheries resources of the Nation. Appropriations to carry those purposes are authorized under sections 4(a), (b), and (c) of the Act. Section 4(a) authorizes annual appropriations to the Secretary of the Interior of \$5 million during a total 5-year program. The funds would be apportioned among the States on a matching basis according to the extent of commercial fisheries in each State as represented by the value of raw fish harvested by domestic fishing vessels and received within each State plus the average value of the fishery products manufactured within each State. However, no State may receive an apportionment for any fiscal year of more than 6 percent of the total funds. As amended, section 4(b) authorizes separate and additional annual appropriations of \$400,000 for the first 2 years of the program and \$650,000 for the next 3 succeeding years, which shall be made available to States in amounts as the Secretary of the Interior may determine appropriate for the purposes of the Act: Provided that the Secretary shall give a preference to those States in which he determines there is a commercial fishery failure due to a resource disaster arising from natural or undetermined causes. Section 4(c) would authorize an additional annual appropriation of \$100,000 during the 5-year program, which shall be made available to the States in such amounts as the Secretary of the Interior may determine for developing a new commercial fishery therein. Each State desiring to take advantage of the benefits of the Act is required to submit plans for any proposed proj-

ect to the Secretary of the Interior. The Secretary has the authority to approve the plans and pay to the State the Federal share of any approved project in an amount not exceeding 75 percent of the total cost. The amended bill also contains provisions which would amend section 4 of the Fish and Wildlife Act of 1956. This would permit the Secretary of the Interior to use funds appropriated under the Bureau of Commercial Fisheries' Fishery Loan Program, to make loans to commercial fishermen "for the purpose of chartering fishing vessels pending the construction or repair of vessels lost, destroyed, or damaged by the earthquake of March 27, 1964." Funds for those loans would be available until June 30, 1966, and repayment would be made "only. . . from the net profits of the operations of such chartered vessels, which profits shall be reduced by such reasonable amounts as determined by the Secretary for the salary of the fishermen chartering such vessels."

COMMERCIAL FISHERY RESOURCES SURVEY: S. J. Res. 174 (Magnuson) introduced in the Senate April 23, 1964, to authorize and direct the Bureau of Commercial Fisheries to conduct a survey of the marine and fresh-water commercial fishery resources of the United States, its territories, and possessions; referred to the Committee on Commerce. Senator Magnuson referred to a previous survey of United States fisheries made shortly after World War II, and then stated, in part, "Since then many new conditions and circumstances have arisen affecting the living resources of the adjacent seas and the many industries utilizing these resources. . . . The depletion of favored food species is occurring not only in waters that are the mainstay of our own fisheries, but around the world. From 1961 to 1962 the world salmon catch declined 220,000 metric tons, a drop of 29 percent. World catches of halibut, sole, and flounder fell 8 percent. . . . External pressures also are threatening the fishery resources in many of our adjacent waters. Massive foreign fishing fleets from overseas are penetrating our richest fishing grounds--grounds where Americans have been fishing for more than 300 years. The survey proposed in the joint resolution would include not only a comprehensive inventory of resources, but studies of production, processing, distribution, transportation, marketing, and storage methods and facilities, and findings on the effects of overfishing by foreign fleets on employment and the national economy. . . ." (Congressional Record, pages 8595-8596, April 23, 1964.)

CONSERVATION OF MARINE FISHERIES RESOURCES: H. Rept. 1356, Prohibition of Foreign Fishing Vessels in the Territorial Waters of the United States (April 28, 1964, Report from the Committee on Merchant Marine and Fisheries, House of Representatives, 88th Congress, 2nd Session, to accompany S. 1988), 20 pp., printed. The Committee reported the bill with amendments and recommended passage. Contains purpose of the bill, need for the legislation, section-by-section analysis, background of the legislation, discussion of the amendments, cost of the legislation, changes in existing law, and departmental reports.

On May 4, 1964, the House passed and sent to the Senate amended S. 1988, a bill to prohibit fishing in the territorial waters of the United States and certain other areas by persons other than nationals or inhabitants of the United States. The text of the bill as passed by the House appears in the Congressional Record (pages 9647-9649.)

On May 6, 1964, the Senate agreed to the House amendments to S. 1988, to prohibit fishing in the ter-

ritorial waters of the United States and certain other areas by persons other than nationals or inhabitants of the United States. This action cleared the legislation for the President's signature. The amended bill declares that it is unlawful for foreign vessels to engage in the fisheries within the territorial waters of the United States and its territories and possessions and the Commonwealth of Puerto Rico, or within any waters in which the United States has the same rights in respect to fisheries as it has in its territorial waters, or to engage in the taking of any Continental Shelf fishery resource which appertains to the United States, except as provided by the Act or as expressly provided by an international agreement to which the United States is a party. Violators would be subject to a fine of not more than \$10,000 or imprisonment of not more than 1 year or both. Every vessel employed in any manner in connection with a violation of the Act shall be subject to forfeiture and all fish taken or retained in violation of the Act or the monetary value thereof shall be forfeited. Enforcement is to be the joint responsibility of the Secretary of the Interior, the Secretary of the Treasury, and the Secretary of the Department in which the Coast Guard is operating; and such State and territorial officers as the Secretary of the Interior may designate. The Secretary of the Treasury and Interior would be authorized jointly or severally to issue such regulations as they determine necessary to carry out the provisions of the Act. The amended bill contains a definition of Continental Shelf fishery resources which states "As used in this Act, the term 'Continental Shelf fishery resources' includes the living organisms belonging to sedentary species; that is to say, organisms which at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil of the Continental Shelf." The approved amendments to the bill would permit the Secretary of the Treasury, after giving 60 days written notice to the President of the Senate and the Speaker of the House, to authorize a foreign vessel to engage in fishing "for designated species" in the U.S. waters "or within any waters in which the United States has the same rights in respect to fisheries as it has in its territorial waters, or for resources of the Continental Shelf which appertain to the United States." This permission would be granted only after the Secretaries of State and Interior have certified that it would be in the national interest, and upon concurrence of "any State, Commonwealth, territory or possession directly affected," and after a finding by the Secretary of the Interior that the country involved extends the same privileges to U.S. vessels. The amended bill would also permit the Secretary of State, with concurrence of the Secretaries of the Treasury and the Interior to grant permission to a vessel "owned or operated by an international organization of which the United States is a member to engage in fishery research within the territorial waters of the United States. . . and to land its catch in a port of the United States, in accordance with such conditions as the Secretary may prescribe whenever they determine such action is in the national interest." The title of the amended bill was changed so as to read "An Act to prohibit fishing in the territorial waters of the United States and in certain other areas by vessels other than vessels of the United States and by persons in charge of such vessels."

CONTINENTAL SHELF CONVENTION: On May 12, 1964, Senator Bartlett spoke from the floor of the Senate concerning the ratification by the United Kingdom of the International Convention on the Continental Shelf. The Convention will come into effect on June 10, 1964. The Senator stated in part, "The International Conven-

tion on the Continental Shelf was one of four conventions adopted in 1958 at the United Nations Conference on the Law of the Sea. The Convention on the High Seas has been ratified by the required number of nations including the United States and became effective last summer. The Convention on the Continental Shelf will be the second of the four conventions to come into force. This will leave the Convention on the Territorial Sea and the Convention on Fishing and Conservation of the Living Resources of the High Seas to be favorably acted upon later. . . ." The United States has ratified all four. The Senator continued: "In essence, the Continental Shelf Convention provides that each coastal nation has exclusive rights to the resources of the Continental Shelf extending beyond the limits of its territorial waters. The Continental Shelf Convention was endorsed by 63 of the 85 nations present and voting at the 1958 conference. This number is well in excess of the two-thirds vote required for the convention's acceptance. The overwhelmingly favorable vote demonstrated the consensus among nations that the convention's terms are acknowledged international law. The 22 countries that have ratified the convention are: United States, Byelorussia, Colombia, Czechoslovakia, Guatemala, Haiti, Israel, Poland, Portugal, Ukrainian Russia, U.S.S.R., Venezuela, Denmark, Australia, South Africa, Cambodia, Malaysia, Senegal, Rumania, Malagasy Republic, Bulgaria, and the United Kingdom.

"The convention, in part, confirms unilateral action taken by our country under the Truman proclamation on the Continental Shelf of 1946, and the Submerged Lands Act and the Outer Continental Shelf Lands Act of 1954. These acts give to the Federal Government, with certain exceptions, all rights over the mineral resources on the Continental Shelf. These acts at the same time confirm state jurisdiction over the regulation of fishing resources. The Continental Shelf Convention provides as follows: 'The coastal state exercises over the Continental Shelf sovereign rights for the purpose of exploring it and exploiting its natural resources. *** The natural resources referred to in these articles consist of the mineral and other nonliving resources of the seabed and subsoil together with living organisms belonging to sedentary species, that is to say, organisms which at the harvestable stage either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or subsoil.'"

Senator Bartlett also included a table in the Record indicating the value of the catch of oysters, Dungeness, and king crabs, and clams taken by the states in 1961. (Congressional Record, pages 10326-10328.)

FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT: On April 29, 1964, the House concurred in a Senate amendment to a House amendment to S. 1605, to amend the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, to provide for labeling of economic poisons with registration numbers, and to eliminate registration under protest. This action cleared the legislation for the President.

S. 2792 (Ribicoff et al) introduced in the Senate on April 30, 1964, to amend the Federal Insecticide, Fungicide, and Rodenticide Act in order to provide for more effective regulation under such act, and to provide for certain control of waste disposal in connection with the manufacture, formulation, or other processing of economic poisons; referred to the Committee on Agriculture and Forestry. The text of the bill was printed in the Congressional Record, pages 9317-9318.

Introducing the bill, Senator Ribicoff stated, in part, "The bill I introduce today follows in many respects the regulatory pattern already established to assure safety and high quality in the field of drugs. First, it requires every pesticide manufacturer and packager to register annually with the Department of Agriculture his name and places of business. Second, it permits inspection of establishments in which pesticides are made, processed, packed or held. Third, it provides that a pesticide shall be deemed adulterated--and thus subject to seizure or injunction against shipment--if the facilities or methods used in production do not conform to or are not operated or administered in conformity with current good manufacturing practice to assure that the pesticide meets requirements of safety, identity, strength, quality, and priority. Fourth, it empowers Federal courts to issue injunctions to enforce the act and to restrain violations of it. Fifth, it amends the penalty provisions of existing law by adding civil remedies and establishing willfulness as an element of existing criminal violations. Sixth, it requires every pesticide manufacturer and packager to obtain a Federal waste disposal permit, to make sure that waste disposal in the manufacturing process will not cause air or water pollution that endangers public health or welfare. . . ." (Congressional Record, pages 9317-9318.)

H. R. 11110 (Rosenthal) introduced in the House May 4, 1964, to amend the Federal Insecticide, Fungicide, and Rodenticide Act to provide for more effective regulation under such act, and for other purposes; referred to the Committee on Agriculture.

On May 12, 1964, the President signed into law S. 1605 (P. L. 88-305).

FISHERIES LEGISLATION: Miscellaneous Fisheries Legislation--Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, 88th Congress (2nd Session), on Commercial Fishery Research (S. 627, H. R. 3738, H. R. 5229, H. R. 5539, H. R. 5561, H. R. 5798, H. R. 7698, H. R. 7710, H. R. 7766, H. R. 8537), March 3-5, 1964; Alaska Fishery Problems, April 16, 1964; Marine Mammal Protection (H. R. 5240), June 19, 1963; Fishing Rights for Vessel SC-1473 (H. R. 6007), March 5, 1964; Serial No. 88-18, 348 pp., printed. Contains reports on indicated hearings, and statements of Senators, Congressmen, Federal and State officials, and public witnesses.

FISHERIES LIMITS: On April 20, 1964, Congressman Tollefson, Westland, and Clausen spoke from the floor of the House expressing their concern over the Canadian proposal to establish a 12-mile fisheries limit. (Congressional Record, pages 8144-8146.)

FISHING VESSEL PROTECTION: H. R. 10986 (Tollefson) introduced in the House April 21, 1964, and H. R. 11158 (O'Neill), introduced in the House on May 6, to aid in the protection of the rights of vessels of the United States engaged in the fisheries and related activities in international waters, and for other purposes; referred to the Committee on Ways and Means. Congressman O'Neill's remarks in the Congressional Record (pages 9924-9925), were concerned with the proposed extension of Canadian fishing limits and a similar or identical bill previously introduced by Congressman Pelly (H. R. 7815).

FOOD-FOR-PEACE, AND FISH: Administration of 1963 Fishery Amendment to Public Law 480 (Hearing before the Subcommittee on Foreign Agricultural Opera-

tions of the Committee on Agriculture, House of Representatives, 88th Congress, 2nd Session), Serial MM, 34 pp., printed. Contains hearings held February 27, 1964. Included are statements by Congressmen, Federal and State officials, and fishing industry representatives on including fishery products in the food-for-peace program and distributed under Public Law 480, the Agricultural Trade and Development Act of 1954. Would treat fishery products in the same manner as surplus agricultural commodities.

Extension of Public Law 480--Titles I and II (Hearings before the Subcommittee on Foreign Agricultural Operations of the Committee on Agriculture, House of Representatives, 88th Congress, 2nd Session), Serial LL, 192 pp., printed. Contains hearings held February 18, 19, 20, and 28, 1964. Included are statements by Congressmen, Federal officials and public witnesses. Fishery products would be included under Title I.

FOOD MARKETING NATIONAL COMMISSION: H. J. Res. 1009 (Findley) introduced in the House April 23, 1964, to establish a National Commission on Food Marketing to study the food industry from the farm to the consumer; referred to the Committee on Agriculture. Congressman Findley's remarks in introducing the resolution appear in that day's Congressional Record (pages 8590-8591).

On April 30, 1964, the Senate Committee on Commerce concluded hearings on S. J. Res. 71 on the same subject.

On May 7, 1964, the House Committee on Agriculture held a hearing on H. J. Res. 977, and related bills; testimony was received from Congressmen and public witnesses. On May 11, 1964, the same Committee in executive session ordered reported (H. Rept. No. 1401) favorably to the House H. J. Res. 977 (amended).

On May 12, 1964, the Committee on Commerce reported S. J. Res. 71 to the Senate with amendments, to establish a National Commission on Food Marketing to study the food industry from the farm to the consumer (S. Rept. No. 1022).

HALIBUT WEEK: H. Con. Res. 291 (Hansen) introduced in House on April 22, 1964, requesting the President to proclaim the 6-day period beginning May 18, 1964, and ending May 23, 1964, as National Halibut Week; referred to the Committee on the Judiciary.

INDIAN FISHING RIGHTS: On April 22, 1964, Congressman Westland under an extension of remarks discussed Indian fishing practices and inserted in that day's Congressional Record (Appendix page A2022) a resolution of the Inter-Tribal Council of Western Washington Indians.

INTERIOR APPROPRIATIONS FY 1965: On May 4, 1964, Senator Proxmire submitted two amendments (Nos. 566 and 567), to the Department of the Interior and related agencies appropriation bill (H. R. 10433). Senator Proxmire said his first amendment would reduce the amounts appropriated by the bill as reported from the Senate Appropriations Committee to the House figure or the budget figure, whichever is lower. The second amendment would eliminate all items not provided for in the President's budget. Regarding the Bureau of Commercial Fisheries, the Proxmire amendments would reduce the appropriation for "Management and Investigation of Resources" to \$17,817,900 (not including the transfer of \$2,125,000 from the Pribilof

Islands Fund). The amount proposed by Senator Proxmire is \$15,000 less than the House-passed bill, and \$852,000 less than the amount recommended by the Senate Appropriations Committee. (Congressional Record, May 4, pages 9577-9578.)

LAW OF THE SEA STUDY: H. R. 11232 (Hanna) introduced in the House on May 13, 1964, a bill providing for a study of the legal problems of management, use, and control of the natural resources of the oceans and ocean beds; referred to the Committee on Science and Astronautics. The bill would authorize an appropriation of \$50,000 for a study by the National Science Foundation of the legal problems arising out of the use, management, and control of ocean resources. Congressman Hanna's remarks (Congressional Record of that day, page 10387), pointed out that the proposed bill would authorize a modest sum of money to energize the resources of some of our outstanding legal institutions to provide leadership and guidance in the important field of the law of the oceans.

MARINE MAMMAL PROTECTION: H. R. 5240 (Saylor) introduced in the House March 28, 1963, for the protection of marine mammals on the high seas, and for other purposes. This bill would provide protection, conservation, and management of the polar bear, sea otter, and walrus only. See under heading "Fisheries Legislation" for report of hearings on this subject.

MEDICAL CARE FOR VESSEL PERSONNEL: Medical Care for Self-Employed Seamen (Hearings before a Subcommittee of the Committee on Interstate and Foreign Commerce, House of Representatives, 88th Congress, 1st Session), 79 pp., printed. Contains hearings held October 14 and 24, 1963, on H. R. 2108 and related bills. Includes the texts of H. R. 2108, H. R. 2669, H. R. 3338, H. R. 3873, H. R. 7002, and S. 978; reports from various Federal Agencies; and statements of Congressmen, Federal officials, and public witnesses.

MEDICAL CARE FOR VESSEL OWNERS: On April 29, 1964, the Subcommittee on Public Health and Safety of the House Committee on Interstate and Foreign Commerce met in executive session and ordered reported favorably to the full committee H. R. 3873, to amend section 322 of the Public Health Service Act to permit certain owners of fishing boats to receive medical care and hospitalization without charge at hospitals of the Public Health Service.

RESEARCH PROGRAMS: Federal Research and Development Programs (Hearings and Summary of Hearings before the Select Committee on Government Research, House of Representatives, 88th Congress, 1st and 2nd Sessions), Part 1, 724 pp.; and Part 3, 229 pp.; printed. Part 1 contains hearings held Nov. 18, 19, 20, 21, and 22, 1963. Included are statements of various Federal officials, educators, and others. Part 3 contains summary and index of hearings held Nov. 18, 19, 20, 21, and 22, 1963; December 11 and 12, 1963; and held January 22, 1964.

On May 7, 1964, the Subcommittee on Science, Research, and Development of the House Committee on Science and Astronautics held a hearing on the geographical distribution of Federal research and development contracts and grants, and allowance of indirect costs by those doing basic research for the Federal Government. The Science Adviser to the Secretary of the U. S. Department of the Interior testified at the hearing.

STATE DEPARTMENT APPROPRIATIONS FY 1965: On May 4, 1964, the House Committee on Appropriations reported H. R. 11134 (H. Rept. 1374).

H. Rept. 1374, Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriation Bill, Fiscal Year 1965 (May 4, 1964, report from the Committee on Appropriations, House of Representatives, 88th Congress, 2nd Session), 43 pp., printed. Included are funds for the international fisheries commissions. The Committee recommended an appropriation of \$2,000,000 for the international fisheries commissions, the same as the 1964 appropriation, but less than the budget estimate of \$2,139,000.

Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriations for 1965 (Hearings before a Subcommittee of the Committee on Appropriations, House of Representatives, 88th Congress, 2nd Session), 1,287 pp., printed. Contains hearings held on appropriations for the Department of State for fiscal year ending June 30, 1965. Included in Department of State appropriations are funds for the International Fisheries Commissions.

The bill passed the House on May 6. It provides appropriations for the Departments of State, Justice, and Commerce; the Judiciary, and related agencies for the fiscal year ending June 30, 1965, and for other purposes. As approved by the House, the bill appropriates \$2,000,000 for the International Fisheries Commission, the same amount approved for FY 1964, but \$139,000 less than the State Department's budget request.

Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriations for 1965 (Hearings before a Subcommittee of the Committee on Appropriations, House of Representatives, 88th Congress, 2nd Session), 1,046 pp., printed. Includes, among "the related agencies," hearings held on appropriations and funds for the Tariff Commission.

TRADE NEGOTIATIONS: On April 29, 1964, Congressman Keith spoke from the floor of the House in a discussion of the possible effects on domestic industry of the forthcoming trade negotiations in Geneva under the General Agreement on Tariffs and Trade--references to the fishing industry were included in his remarks (Congressional Record, pages 9164-9165). The subject on the same day was also discussed from the floor of the House by Congressman Sikes (Congressional Record, pages 9166-9168), and Congressman Tol-letson (Congressional Record, page 9180). On May 5, 1964, the forthcoming negotiations were discussed from the floor of the Senate by Senator Javits, and included in his remarks were newspaper articles and editorials (Congressional Record, pages 9752-9754).

On May 14, 1964, Congressman Curtis under an extension of remarks discussed (Congressional Record, pages A2519-A2521) items on the agenda of the United Nations' Conference of Trade and Development. The Congressman included an article ("Trade Policies for Development Countries") from the April 1964 issue of the First National City Bank of New York's "Monthly Economic Letter."

TRANSPORTATION ACT OF 1964: S. 2796 (Magnuson et al) introduced in the Senate on May 2, 1964, to provide for strengthening and improving the national transportation system and for other purposes; referred to the Committee on Commerce. Senator Magnuson's descriptive remarks when he introduced the bill appeared in that day's Congressional Record (page 9526).

TRANSPORTATION AMENDMENTS OF 1964: The House Committee on Interstate and Foreign Commerce met on April 23, 1964, in executive session and approved several committee amendments to H. R. 9903, a bill to amend the Interstate Commerce Act and the Federal Aviation Act of 1958 so as to strengthen and improve the national transportation system, and to implement more fully the national transportation policy, and for other purposes. The amendments will be presented on the floor of the House when the bill is considered.

On April 29, 1964, the House Committee on Rules denied a rule and motion for reconsideration filed on H. R. 9903.

VESSEL CONSTRUCTION SUBSIDY AMENDMENTS: On April 27, 1964, Congressman Pelly under an extension of remarks discussed the opposition of the halibut industry to S. 1006, to amend the act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes. Congressman Pelly stated that S. 1006 is opposed by the following organizations: Fishing Vessel Owners Association, Deep Sea Fishermen's Union, Purse Seine Vessel Owners Marketing Association, Fishermen's Cooperative Association, Halibut Producers' Cooperative, and Fishermen's Marketing Association of Washington. (Congressional Record, Appendix page A2075.)

On May 4, 1964, Congressman Bates requested that the Chairman of the House Merchant Marine and Fisheries Committee clear S. 1006 for floor discussion. The Congressman stated that "while he goes along with the gentleman's committee for the extension of the Maritime Act (construction differential), I think it is high time we report out a bill which would equalize these costs with respect to fishermen." The Chairman of the Committee indicated S. 1006 would be acted upon "in the immediate future."

VESSEL MEASUREMENT: S. 2793 (Magnuson) introduced in the Senate on April 30, 1964, to simplify the admeasurement of small vessels; referred to the Committee on Commerce. Introducing the bill, Senator Magnuson remarked that the bill was designed to simplify the admeasurement of small pleasure vessels. (Congressional Record, pages 9361-9364.)

WATER POLLUTION CONTROL ADMINISTRATION: Water Pollution Control Act Amendments (Hearings before the Committee on Public Works, House of Representatives, 88th Congress, 1st and 2nd Sessions), 959 pp., printed. Contains hearings held December 4, 5, 6, 9, and 10, 1963; February 4, 5, 6, 7, 17, 18, and 19, 1964, on S. 649 and companion bill H. R. 3166, and related bills. Included are statements of various Federal, State, and municipal officials, Congressmen, and public witnesses. S. 649 would amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to provide grants for research and development, to increase grants for construction of municipal sewage treatment works, to authorize the issuance of regulations to aid in preventing, controlling, and abating pollution of interstate waters.

Senator Metcalf spoke from the floor of the Senate on April 22, 1964, inserting in that day's Congressional Record (pages 8489-8491) an address by Senator Muskie at Duke University, April 16, 1964, on the pending bill S. 649, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to increase grants for con-

struction of municipal sewage treatment works, to provide financial assistance to municipalities and others for the separation of combined sewers, to authorize the issuance of regulations to aid in preventing, controlling, and abating pollution of interstate, or navigable waters, and for other purposes.

WATER POLLUTION CONTROL AID TO INDUSTRY: H. R. 11021 (St. Onge), introduced in the House on April 23, 1964, to amend the Internal Revenue Code of 1954 to encourage the construction of treatment works to control water and air pollution by permitting the deduction of expenditures for the construction, erection, installation, or acquisition of such treatment works; referred to the Committee on Ways and Means. Congressman St. Onge under an extension of remarks discussed at length the purpose of the bill in that day's Congressional Record (Appendix pages A2053-A2054).

On May 12, 1964, Congressman Dingell under an extension of remarks inserted an article from the May 5, 1954, Detroit News on continuing use of streams and rivers as disposal areas for dangerous chemicals, untreated sewage, and other wastes from construction and industry. (Congressional Record, Appendix pages A2436-A2437.)

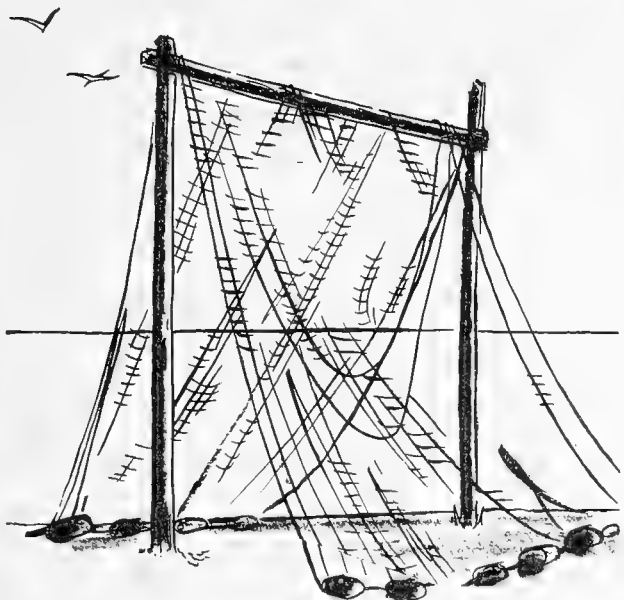
WATER RESOURCES COUNCIL: The Subcommittee on Irrigation and Reclamation of the House Committee on Interior and Insular Affairs held a hearing April 20, 1964, on H. R. 3620 and S. 1111, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a Water Resources Council and River Basin Commission, and by providing financial assistance to the States in order to increase State participation in such planning. Testimony was given by various Federal officials.



BAKED HADDOCK A LA MARITIMES

- | | |
|---|--------------------------|
| 2 pounds haddock fillets or other fish fillets, fresh or frozen | 1 tablespoon lemon juice |
| 2 cans (4 ounces each) sliced mushrooms, drained | 3/4 teaspoon salt |
| 1/4 cup chopped onion | 1 cup soft bread crumbs |
| 1/4 cup melted fat or oil | 6 slices tomato |
| 1/2 cup chopped parsley | 1/4 teaspoon salt |
| 1 egg, beaten | Dash pepper |
| | 1/4 cup grated cheese |

Thaw frozen fillets. Skin fillets and cut into serving-size portions. Place in a single layer in a well-greased baking dish, 12 x 8 x 2 inches. Cook mushrooms and onion in fat until tender; add parsley. Combine egg, lemon juice, and salt. Brush fish with egg mixture. Top with crumbs. Arrange tomatoes over crumbs; sprinkle with salt and pepper. Spread mushroom mixture over tomatoes. Sprinkle with cheese. Bake in a moderate oven, 350° F., for 35 to 40 minutes or until fish flakes easily when tested with a fork. Serves 6.



This eye-catcher gives a new taste-tempting twist to haddock, a popular favorite, with economy the keyword. Haddock fillets topped with tomato slices, parsley, and cheese provide an appealing array of color to brighten both your dinner table and your family's appetites. The mellow magic of mushrooms combined with a hint of onion adds that certain gourmet touch to a seafood meal you'll serve often.

--From Fisheries Marketing Bulletin: "Protein Treasure from the Seven Seas." Issued by the National Marketing Services Office, U. S. Bureau of Commercial Fisheries, Chicago, Ill. 60607.



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THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
 FL - FISHERY LEAFLETS.
 SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
 SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
 SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

| Number | Title |
|----------|---|
| CFS-3384 | - Michigan Landings, September 1963, 3 pp. |
| CFS-3412 | - Frozen Fishery Products, January 1964, 8 pp. |
| CFS-3421 | - Alaska Fisheries, 1962 Annual Summary, 8 pp. |
| CFS-3436 | - Maine Landings, December 1963, 4 pp. |
| CFS-3441 | - Michigan Landings, December 1963, 3 pp. |
| CFS-3443 | - California Landings, November 1963, 4 pp. |
| CFS-3444 | - New Jersey Landings, January 1964, 3 pp. |
| CFS-3445 | - Washington Landings, 1963 Annual Summary, 2 pp. |
| CFS-3446 | - Louisiana Landings, January 1964, 3 pp. |
| CFS-3447 | - Rhode Island Landings, December 1963, 3 pp. |
| CFS-3448 | - Shrimp Landings, October 1963, 8 pp. |
| CFS-3449 | - Pacific Coast Fisheries, 1962 Annual Summary, 6 pp. |
| CFS-3452 | - Wisconsin Landings, January 1964, 2 pp. |
| CFS-3453 | - Canned Fishery Products, 1963 Annual Summary, 18 pp. |
| CFS-3454 | - Industrial Fishery Products, 1963 Annual Summary, 9 pp. |
| CFS-3455 | - Packaged Fishery Products, 1963 Annual Summary, 5 pp. |
| CFS-3456 | - California Landings, December 1963, 4 pp. |
| CFS-3457 | - New York Landings, January 1964, 4 pp. |
| CFS-3458 | - Mississippi Landings, December 1963, 3 pp. |
| CFS-3461 | - Maryland Landings, January 1964, 3 pp. |
| CFS-3464 | - Virginia Landings, January 1964, 3 pp. |
| CFS-3468 | - Breaded Shrimp, October-December 1963, 2 pp. |
| CFS-3480 | - Florida Landings, February 1964, 8 pp. |

Wholesale Dealers in Fishery Products (Mississippi River and Tributaries) (Revised):

SL-34 - Wisconsin, 1962, 2 pp.
 SL-35 - Illinois, 1962, 2 pp.
 SL-38 - Missouri, 1962, 2 pp.

SL-39 - Tennessee, 1962, 2 pp.

Sep. No. 704 - Shrimp Explorations Off Vancouver Island (British Columbia) by M/V John N. Cobb, October-November 1962.

FL-550 - Edible Crabs of the United States, by George H. Rees, 20 pp., illus., December 1963. Discusses natural history--molting and growth, reproduction and development, and autotomy and regeneration of lost legs; Atlantic and Gulf coast crabs--blue, stone, rock and jonah, green, deep-sea red, and Samoan crabs; Pacific and Alaska crabs--Dungeness, king, and tanner crabs; and Hawaiian crabs--Kona and other species of crabs.

FL-554 - Spiced and Pickled Seafoods, by Norman D. Jarvis, 19 pp., October 1963. Reviews the history of the use of fishery products preserved with vinegar and spices, and defines the term "pickled." Discusses preservative action of ingredients and requirements for those ingredients. Includes recipes for the preparation of spiced and pickled herring, salmon, mackerel, haddock, sturgeon, oysters, and shrimp.

FL-564 - Parasite of Freshwater Fish. I--Fungi, 1--Fungi (*Saprolegnia* and Relatives) of Fish and Fish Eggs, by Glenn L. Hoffman, 6 pp., illus., December 1963.

FL-565 - Lymphocystis Disease of Fish (Revised), by Ken Wolf, 4 pp., illus., January 1964.

SSR-Fish, No. 449 - Distribution and Relative Abundance of Commercially Important Pandalid Shrimps in the Northeastern Pacific Ocean, by Lael L. Ronholt, 32 pp., illus., December 1963.

SSR-Fish, No. 454 - Fur Seal Investigations, Pribilof Islands, 1962, by Alton Y. Roppel and others, 107 pp., illus., December 1963.

SSR-Fish, No. 458 - Movements of King Crabs Tagged and Released in Shumagin Islands Area, 1957-62, by Murray L. Hayes and Donald T. Montgomery, 10 pp., illus., December 1963.

SSR-Fish, No. 461 - Winter-Run Chinook Salmon in the Sacramento River, California, with Notes on Water Temperature Requirements at Spawning, by Daniel W. Slater, 14 pp., illus., November 1963.

SSR-Fish, No. 463 - Exploratory Fishing for Maine Herring, by Keith A. Smith, 12 pp., illus., December 1963. Exploratory herring fishing operations were

carried out along the Maine coast during the summers of 1955 and 1956 using the research vessel Theodore N. Gill and the chartered small otter trawler Metacomet. The coastal and Gulf of Maine waters were sounded and fished with a lampara seine, gill nets, midwater trawls, and otter trawls. Inshore explorations located zero-year-class herring in the bays and inlets and traced their development in those areas until they became sardine-sized fish in late fall. Sardine-sized and large herring were found occupying an ocean-bottom habitat during the winter. A scattering of large unschooled herring was found in coastal waters during the summer of 1956.

SSR-Fish. No. 471 - Acute Oral Toxicity of 1,496 Chemicals Force-Fed to Carp, by Howard A. Loeb and William H. Kelly, 127 pp., September 1963.

SSR-Fish. No. 474 - Publications on Fish Parasites and Diseases, 330 B. C.-A. D. 1923, by E. A. McGregor, 86 pp., 1963.

SSR-Fish. No. 475 - Pelagic Fur Seal Investigations, Alaska Waters, 1962, by Clifford H. Fiscus, Gary A. Baines, and Ford Wilke, 63 pp., illus., January 1964.

SSR-Wildlife No. 79 - Comprehensive Bibliography of Zostera marina, by Ronald C. Phillips, 38 pp., January 1964. A bibliography on eelgrass.

Bureau of Commercial Fisheries Biological Laboratory, Galveston, Texas, by George A. Rounsefell, Circular 154, 31 pp., illus., printed, November 1963. Discusses the history of the laboratory, climate and recreation, research problems in the Gulf of Mexico, laboratory site, facilities, and publications by staff members.

Monofilament Gill Net Fishing for Skipjack Tuna in Hawaiian Waters 1961-62, by Richard S. Shomura, Circular 170, 25 pp., illus., October 1963. Gill-netting techniques for catching skipjack tuna were investigated in 1961 and 1962, with the joint support of the State of Hawaii and the U. S. Bureau of Commercial Fisheries. The study was carried out by the Bureau personnel on a chartered skipjack vessel from July 23 to September 29, 1961, and May 9, to August 25, 1962. Results indicated that the monofilament gill-net method of fishing will not supplant nor effectively supplement the present pole-and-line method of catching skipjack tuna.

The Northern Fur Seal, by Ralph C. Baker, Ford Wilke, and C. Howard Baltzo, Circular 169, 26 pp., illus., September 1963. Discusses early history of fur sealing in the North Pacific, distribution and movement of seals, food, physical characteristics, reproduction, and mortality and disease. Also covers population, management, research, sealing activity on the Pribilof Islands, and processing and sale of fur seal skins.

The Soft-Shell Clam, by Robert W. Hanks, Circular 162, 19 pp., illus., December 1963. Describes the soft-shell clam industry of the Atlantic coast; reviews past and present economic importance, fishery methods, fishery management programs, and special problems associated with shellfish culture and marketing. Discusses economic losses suffered because of destruction of soft-shell clams by green crabs and other predators, and devices used to control them. Provides a summary of soft-shell clam natural

history including distribution, taxonomy, anatomy, and life cycle.

A Survey of Japanese Research on Shellfisheries and Seaweeds, by John B. Glude, Circular 168, 22 pp., illus., January 1964. Presents observations made on a trip to Japan in July 1958 to explore the status of shellfishery research, to locate sources of scientific information that might be of value to United States biologists, and to encourage international exchange of such scientific information. Discusses facilities for fisheries research; and research work conducted on oysters, clams, pearl oysters, scallops, abalones, shrimp, spiny lobsters, and seaweeds.

Trout Feeds and Feeding, by Arthur M. Phillips, Jr., A. V. Tunison, and George C. Balzer, Circular 159, 41 pp., October 1963.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, February 1964, 14 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, March 1964, 13 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6317, Pt. Loma Station, San Diego, Calif. 92100.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, March 1964, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va., 23669.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--February 1964, 18 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries,

Monthly Summary, March 1964, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ADRIATIC SEA:

Fishes of the Adriatic, by T. Soljan, OTS 60-21661, 431 pp., illus., printed, 1963, \$4.25. (Translated from the Serbo-Croatian, Fauna et Flora Adriatica, Volumen 1, Pesces.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

ALGAE:

Ecology of Floating Algal Communities in Florida, by Ronald C. Phillips, Contribution No. 76, 6 pp., printed, (Reprinted from Quarterly Journal of the Florida Academy of Sciences, vol. 26, no. 4, December 1963, pp. 329-334.) Marine Laboratory, Florida State Board of Conservation, Maritime Base, St. Petersburg, Fla.

The Occurrence of GELIDIELLA TENUISSIMA Feldm. et Hamel in Puerto Rico, by Hugo L. Blomquist and Luis R. Almodovar, 3 pp., illus., printed, (Reprinted from Nova Hedwigia, vol. III, no. 1, 1961, pp. 67-69.) Institute of Marine Biology, University of Puerto Rico, Mayaguez, Puerto Rico.

AMINO ACIDS:

"A Comparative Study of Amino Acids in the Muscle of Different Species of Fish," by Olaf R. Braekkan and Gjermund Boge, article, Fiskeridirektoratets Skrifter, Serie Teknologiske Undersokelser, vol. 4, no. 3, 1962, pp. 1-19, printed. Fiskeridirektoratets, Bergen, Norway.

ANTIBIOTICS:

"Antibiotic Properties of Micro-Organisms Isolated from Various Depths of World Oceans," by E. N. Krasil'nikova, article, Microbiology, vol. 30, March-April 1962, pp. 653-791, printed. (Translated from the Russian, Mikrobiologiya, vol. 30, September-October 1961, pp. 653-791.) American Institute of Biological Sciences, 2000 P St. N. W., Washington, D. C. 20006.

ANTIOXIDANTS:

"The Antioxidant Effects of Sodium Tripolyphosphate and Vegetable Extracts on Cooked Meat and Fish," by Margaret B. Ramsey and Betty M. Watts, article, Food Technology, vol. 17, August 1963, pp. 102-105, printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

BAIT:

"Study on the Bait for Fishing. II--Efficiency of Chum Mixed with Starch Dregs for Mackerel Fishing," by Takeo Koyama and Takashi Kaneda, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, October 1962, pp. 979-984, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

BARNACLES:

Mechanism of Antifouling Action in Shipbottom Paints, by Charles E. Lane and Francis J. Bernard, Final Report, 6 pp., processed, January 1964. The Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

BIOCHEMISTRY:

"Chemical Studies on the Red Muscle (Chai) of Fishes. XIII--Alkali Resistibility of Hemoglobin and Myoglobin," by Fumio Matsuura and Kanehisa Hashimoto, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, February 1962, pp. 201-209, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

BRAZIL:

Pesca--1962, Estrutura e Producao (Fishing Industry, 1962, Structure and Production), 45 pp., processed in Portuguese, January 1964. Ministerio da Agricultura, Departamento Economico, Servico de Estatistica da Producao, Avenida Pasteur no. 404, Terreo, Rio de Janeiro, Brazil.

CALIFORNIA:

California Fish and Game, vol. 50, no. 2, April 1964, 67 pp., illus., printed, single copy 75 cents. Documents Section, P. O. Box 1612, Sacramento, Calif. 95807. Includes, among others, articles on: "Annual Abundance of Young Striped Bass, Roccus saxatilis, in the Sacramento-San Joaquin Delta, California," by Harold K. Chadwick; "Some Observations on Factors Associated with Survival of Striped Bass Eggs and Larvae," by Arnold B. Albrecht; and "Northward Movement of the California Sea Otter," by Robert T. Orr and Thomas C. Poulter.

CANADA:

"Canadian Fisheries in 1963," article, Trade News, vol. 16, no. 8, February 1964, pp. 5-8, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Events of national importance were the announcement of a 12-mile exclusive fishing zone along the entire Canadian coastline to become effective in May 1964; the admission of Japanese vessels to the halibut fishery of eastern Bering Sea and the herring fishery west of the Queen Charlottes; and upward revision of protection for Canadian owners of small vessels under the Fishermen's Indemnity Plan. In the Atlantic fisheries 1963 was a year of strong capital expansion, especially in the freezing industry, with emphasis on a changeover from export of raw ma-

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terials to increased manufacture of items fully processed in Canada. In the Maritime Provinces the catch has grown in value from just under C\$39 million in 1961 to almost C\$50 million in 1963. Newfoundland fishermen had a year of unprecedented prosperity. In relation to the fishermen's over-all income, good results and prices in the herring fishery of British Columbia made up for the sluggish market for halibut; but nothing could write off their summer loss in salmon and they closed the year with earnings nearly C\$9 million smaller than in 1962. Fresh-water fisheries continued at the high level of prosperity established in 1962 until very hot July weather caused a scarcity of ice on the prairies; a long warm fall left many lakes suspended for weeks between the end of open-water fishing and the delayed start of ice fishing; and a botulism scare in the United States caused the market to collapse.

Fisheries Statistics British Columbia, 1962, 16 pp., illus., printed in French and English, 50 Canadian cents, March 1964. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains data on quantity and value of fishery products by species, British Columbia, 1950-62; quantity and value by species and fisheries districts, 1961-62; capital equipment employed in primary fisheries operations, 1961-62; and number of persons engaged in primary fisheries operations, 1961-62.

Office Consolidation of the British Columbia Fishery Regulations Made under the Fisheries Act, Cat. No. Fa4-12/1962, 51 pp., printed, 1962. Queen's Printer and Controller of Stationery, Ottawa, Canada. Regulations covering commercial and sport fishing in tidal and non-tidal waters of British Columbia, except for Canadian national parks.

CAVE FISH:

"Adaptations of Cave Fish," article, New Scientist, vol. 21, no. 376, January 30, 1964, p. 290, printed, single copy 1s. 3d. (about 20 U.S. cents). Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

CLAMS:

Razor Clams, Educational Bulletin No. 4, 13 pp., illus., printed, 1963. Fish Commission, 307 State Office Bldg., 1400 SW. 5th Ave., Portland, Oreg., 97201. Discusses the life history of the razor clam--distribution, description, reproduction and growth, and food habits; digging razor clams--tides, tools and equipment, locating them, and digging; preparing clams for the table--cleaning and cooking razor clams; and regulations for digging.

"Wire Belt Harvests Clams," article, Food Processing, vol. 24, July 1963, 59 pp., printed. Putnam Publishing Co., 111 E. Delaware Pl., Chicago 11, Ill.

COD:

"Merking av Rusefanget Torsk i Omradene Smola-Helgeland" (Tagging of Trap-Net-Caught Cod in the Areas of Smola-Helgeland), by Arvid Hysten, article, Fiskets Gang, vol. 50, no. 5, January 30, 1964, pp. 87-93, illus., printed in Norwegian with English summary. Fiskets Gang, Fiskeridirektoratet, Radstueplass 10, Bergen, Norway.

COLOMBIA:

Foreign Trade Regulations of Colombia, by Gary D. Adams, OBR-64-3, 8 pp., printed, January 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A report of value to businessmen interested in import-export trade with Colombia. In general, Colombia's foreign trade policy is designed to preserve foreign exchange for the importation of capital goods and other items considered essential for economic development, to protect emerging national industries from foreign competition, and to obtain revenue for the government. The report discusses the import tariff system, sales and other internal taxes, documentation and fees, labeling and marking requirements, and special customs provisions. It also includes information on nontariff import trade controls, Colombia's export controls, United States export and import controls, and diplomatic representation between the two countries.

COMMISSIONS:

(Atlantic States Marine Fisheries Commission) Twenty-Second Annual Report 1962/63 (to the Congress of the United States and to the Governors and Legislators of the Fifteen Compacting States), 48 pp., printed. Atlantic States Marine Fisheries Commission, 336 E. College Ave., Tallahassee, Fla. Includes condensed reports of proceedings of the Annual Meeting of the Commission, on the work of the Commission, various committees, and the four section meetings. The North Atlantic Section reports on Soviet fisheries activities off United States coasts, shellfish inspection and purification projects, and destruction of estuarine habitats. The Middle Atlantic Section discusses marsh productivity studies in Delaware, status of the American shad in the Delaware River, and size limits for catches of fluke and hard clams. The Chesapeake Bay Section covers oyster mortalities and rehabilitation program, striped bass and menhaden programs, and shellfish sanitation program. The South Atlantic Section covers shrimp marking and statistical studies, pollution of oyster beds, and exploitation of calico scallop resources. Also included are an address on "Legislation and Resources Conservation," agenda of the Twenty-Second Annual Meeting, and report on financial statements.

CONSERVATION:

Federal Aid in Fish and Wildlife Restoration (Annual Report on Dingell-Johnson and Pittman-Robertson Programs for the Fiscal Year Ending June 30, 1962), 86 pp., processed, 1963. Sport Fishing Institute, Bond Bldg., Washington, D. C. Presents a short program review of expenditures and projects operated during FY 1962, and statistical tables giving data on individual projects, land purchases, hunting and fishing licenses issued by the states, and other pertinent information.

The Race for Inner Space, 39 pp., illus., printed, 1964, 55 cents. Division of Information, Office of the Secretary, U. S. Department of the Interior, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A special report to the Nation dramatizing

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the loss or abuse of areas ideally suited for public use. Contains more than 80 photos that help tell the story of the Department of the Interior's renewed efforts to preserve and provide more outdoor enjoyment for this Nation's growing population and to utilize wisely the total resource environment, ranging from fish and wildlife to minerals and forests. The Bureau of Sport Fisheries and Wildlife asks Americans to "stem the advancing sheet of chemicals and concrete" in its chapter "On Behalf of Our Fellow Creatures." The Bureau of Commercial Fisheries points out the necessity "to harness the seas so that the land and its inhabitants may prosper." The short history of the Bureau of Outdoor Recreation is told in a chapter, "Birth of a Bureau." The Bureau of Reclamation's section, "Build a Better Water Trap," shows how a trickle of visitors to reservoirs has grown to a steady stream. The Bureau of Land Management's contribution, "466 Million Acres in the Bank," tells the story of "the race between preservation and abuse," on the public lands. The Bureau of Mines and of Indian Affairs, the Office of Territories, and the Geological Survey add their contributions to an overall view of what is happening to the earth's space and its occupants.

CRABS:

Yorkshire Crab Investigations 1962, Laboratory Leaflet (New Series) No. 3, 14 pp., illus., processed, May 1963. Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Burnham-on-Crouch, Essex, England.

DENMARK:

Fiskeriberetning for Aret 1962 (The Ministry of Fisheries Annual Report for 1962), 132 pp., illus., printed in Danish with English resume, Kr. 7.50 (about US\$1.10). Fiskeriministeriet, 1 Kommission Hos, G.E.C. Gad, Copenhagen, Denmark. Includes information and statistical tables on number of fishermen employed, fishing vessels and gear, and landings of fish and shellfish. Also contains information on trout farms; production of canned, filleted, and smoked fish; and foreign trade in fishery products.

Regulation of the Fisheries in Danish Waters, by Erik Ursin, 10 pp., processed, 1964. (Translated from the Danish, Fiskeriaarbogen, 1963.) Danmarks Fiskeriog Havundersogelser, Charlottenlund, Denmark. (A limited number of copies of the translation are available from the United States Embassy, Copenhagen, Denmark.) The aims of fishery regulation may be either to increase total landings in the ports or to increase the individual vessel's landings. If the fisheries are regulated with a minimum size-limit, these rules must be followed if the stock is to be utilized in the best way: (1) A definite minimum size-limit corresponds to the number of vessels; and (2) The more cutters, the higher the minimum size-limit. Methods to regulate a fishery include ways to restrict the fishery effort--controlling the number of vessels, prohibiting fishing at certain times of the year; and ways to protect the young--minimum size-limit regulations, mesh-size control. Other methods of regulating a fishery are preservation of roe fish and transplanting of young fish to better places for growth. Other topics discussed are difficulties with predatory fish, economics of catchability, and natural

variations in the stock. It is impossible to protect all stocks equally, states the author.

ECOLOGY:

Freshwater Ecology, by T. T. Macan, 348 pp., illus., printed, 1964, \$6.50. Longman, Green and Co., Ltd., 6-7 Clifford St., London W1, England.

ECUADOR:

"Apuntes e Informaciones sobre las Pesquerias en la Provincia de El Oro" (Memoranda and Information on the Fisheries in the Province of El Oro), by Raul Jaramillo del Castillo, Pedro Valverde A., and Domingo Quiroga, article, Boletin Informativo, vol. I, no. 1, December 1963, pp. 1-30, illus., printed in Spanish. Instituto Nacional de Pesca del Ecuador, Guayaquil, Ecuador.

Labor Law and Practice in Ecuador, BLS Report No. 242, 45 pp., illus., printed, February 1963, 35 cents. Bureau of Labor Statistics, U.S. Department of Labor, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses Ecuador's geographic setting, manpower resources, culture and customs, education and health, and government in relation to labor. Also covers industrial relations; pay and allowances; hours of work and premiums; safety, facilities, and insurance; and employment practices. Included are statistical tables showing data on economically active population, by economic sector, sex, occupation, age, and geographic area; number of schools and enrollment, by type of school; and other similar information.

FAROE ISLANDS:

Faroes in Figures, no. 23, September 1963, 7 pp., illus., printed. Foroya Fiskasola, Torshavn, Faroe Islands. Includes an article on "Development of the Faroese Fishing Fleet," financial statement of the Faroese Fishing Vessel Mortgage Finance Corporation, and statistical tables on export and production of saltfish and dried cod.

Faroes in Figures, no. 24, December 1963, 7 pp., illus., printed. Foroya Fiskasola, Torshavn, Faroe Islands. Presents an article, "Loan and Deposits of the Faroese Monetary Institutions," which includes information on renewal of the fishing fleet, export of fishery products, debenture and loans secured on fishing vessels, and other topics. Also contains statistical tables on export and production of saltfish, dried cod, and frozen fish fillets.

Faroes in Figures, no. 25, March 1964, 7 pp., illus., printed. Foroya Fiskasola, Torshavn, Faroe Islands. Presents an article, "The Economic Development in the Faroes in 1963," which includes information on landings and exports of fishery products, status of the fishing fleet, and other topics. Also contains statistical tables on export and production of saltfish, dried cod, and frozen fish fillets.

FISH BEHAVIOR:

Effect of Constant Magnetic Field on Conditioned Reflexes in Sea Fish, by Yu. A. Kholodov and G. L. Verevkina, 15 pp., illus., printed, 50 cents, December 1963. (Translated from the Russian, Biologiya Belogo

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Morya, vol. 1, 1962.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

Formation of Conditioned Reflex Responses to Magnetic Field in Fish, by Yu. A. Kholodov, F-190, 15 pp., printed, January 1964, 50 cents. (Translated from the Russian, *Trudy Soveshchaniya po Fiziologii Ryb Akademii Nauk SSSR*, no. 8, 1958.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

FISH FARMING:

"Farming under the Sea," by William Reed, article, Current Affairs Bulletin of the Indo-Pacific Fisheries Council, vol. 36, April 1963, pp. 12-14, printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Regional Office, Bangkok, Thailand.

FISH FAT:

"Component Glycerides of an Indian Fresh-Water Fish Fat," by S. P. Pathak and B. R. Reddy, article, Journal of the Science of Food and Agriculture, vol. 14, June 1963, pp. 395-398, printed. The Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

"Fat in Some Teleost Fish," by Wincenty Kilarski, article, Acta Biologica Cracoviensia Serie Zoologie, vol. 3, no. 1, 1960, pp. 23-57, printed. Biologica Cracoviensia Serie Zoologie, Polska Akademia Nauk, Komisja Biologiczna, Krakow, Poland.

FISH FINDER:

Fish-Finding with Sonar, 85 pp., illus., printed, 1964. Simrad, Simonsen Radio A. S. Oslo, Norway. (Available through Simrad distributors and agents throughout the world.) Locating fish with some type of device has been a fisherman's dream, but in recent years that dream has become reality. There are a number of different types of fish-finders now on the market. This particular book deals with the use of sonar in locating fish. It is the first book written in English on the theory and practice of finding fish with sonar. This written guide will do much to aid any fisherman or biologist in using sonar effectively. Written in simple terms, it deals with the basic elements of sonar and goes on to discuss its practical uses. It seeks to acquaint operators of sets with the elementary principles of physics that are involved as well as with the basic operations of the set. The chapters in the little book include discussions of elementary acoustics, some notes on elementary oceanography, how sonar functions, classification of a sonar echo, search methods, and practical applications. A team of internationally known experts wrote the book: Finn Devold, head of the herring investigations at the Marine Research Institute, Bergen, Norway; Lars Middtun, an oceanographer; and Gudmund Vestnes, and experienced commercial sonar operator (more than 30,000 hours). It is well illustrated with diagrams, drawings, and sample echograms. Finn Devold in the introduction says: "The book should be found not only wherever courses in sonar are conducted, but also aboard every vessel that is, or some day may be, equipped with sonar."

--Joseph Pileggi

FISH PROTEIN CONCENTRATE:

"Factors Influencing the Nutritional Value of Fish Flour, III--Further Studies on Availability of Amino Acids," by A. B. Morrison, article, Canadian Journal of Biochemistry and Physiology, vol. 41, July 1963, pp. 1589-1594, printed. National Research Council, Sussex St., Ottawa 2, Canada.

FISHWAYS:

Pool-Type Fishways--Biological Aspects in Their Construction, by Stanislaw Salowicz and Stanislaw Zarnecki, OTS 60-21496, 139 pp., illus., printed, \$1.50, 1962. (Translated from the Polish, *Roczniki Nauk Rolniczych*, vol. 69, ser. D, 1954, pp. 5-171.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235. Discusses in detail types of fishways; fishways in Central European rivers; fishways on Scottish rivers; design of fishways--placement, the approach, the outlet (fish entrance), guiding screens, the inlet (fish exit), route of the fishway, pool structure, weirs between pools, openings in weirs between pools, drop between pools, illumination, protective screens, control fyke nets, building nets, water discharge, and attracting water.

FLORIDA:

Review of Recent Progress in Departmental Marine Research, edited by Robert M. Ingle, Special Scientific Report No. 7, 14 pp., processed, December 31, 1963. Marine Laboratory, The Florida State Board of Conservation, Maritime Base, St. Petersburg, Fla. Reports on accomplishments of the Salt Water Fisheries Division in research projects in shellfish nutrition, shellfish purification, fisheries plankton studies, spiny lobster studies, fish tagging and other finfish studies, shrimp investigations, exploratory fishing, ecological studies, and various phases of red tide investigation. A report on "Scientific and Practicable Conversion of Marine Trash Materials into Composts and Fertilizers" is also included.

FOOD TECHNOLOGY:

Food Technology the World Over, vol. 1--Europe, Canada and the United States, Australia, edited by Martin S. Peterson and Donald K. Tressler, 540 pp., illus., printed (1963), \$15 (foreign \$16). The Avi Publishing Company, Inc., P. O. Box 388, Westport, Conn. The first of two volumes describing the technologies of the more highly-industrialized nations. Volume 1 is the work of many writers, each of whom is closely acquainted with the particular nation's food industry and technology. There are five parts. Parts 1 and 2, food manufacturing around the world and technological determinants in the evolution of the modern highly-mechanized food industry, provide orientation for the succeeding three parts. Parts II, IV, and V deal, respectively, with the technologies of selected nations of Europe (Denmark, France, Western Germany, the Netherlands, Sweden, United Kingdom, and the Union of Soviet Socialist Republics), of Canada and the United States, and of Australia. Tables and map in Part I present many facets of the world food picture (amount processed, world trade, number of factories, etc.) in interesting detail. Part III offers a broad view of the structure of food technology in Europe--its engineering, scientific, and technological supporting programs, distribution facilities, and background information on the national food economy and the nutritional status of its populations. Part IV

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deals directly with the food technology in Canada and the United States. Part V presents the story of Australia's energetic attack on problems inherent in her food economy and geography. Modest bibliographies contain carefully selected references.

--Frank T. Piskur

FREEZE-DRYING:

Freeze-Drying: Cost Projection, by Kermit Bird, Marketing Research Report No. 639, 37 pp., illus., processed, January 1964. Marketing Economics Division, Economic Research Service, U. S. Department of Agriculture, Washington, D. C. 20250.

Selected Writings of Freeze-Drying of Foods, by Kermit Bird, ERS-147, 54 pp., illus., processed, January 1964. Marketing Economics Division, Economic Research Service, U. S. Department of Agriculture, Washington, D. C. 20250.

FRESH-WATER FISH:

"Notes on the Distribution of Freshwater Fishes," by L. F. de Beaufort, article, Copeia, no. 1, March 26, 1964, pp. 60-65, illus., printed. American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

GEAR:

"The Lake Erie Gear Development Project--1959," A. W. Lantz, article, Progress Reports of the Biological Station and the Technological Unit, Fisheries Research Board of Canada, no. 2, May 1961, pp. 5-14, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

A Simple Integrating Depth Recorder, by B. V. Hamon, D. J. Tranter, and A. C. Heron, Collected Reprint 498, 3 pp., illus., printed. (Reprinted from Deep-Sea Research, vol. 10, 1963, pp. 457-458.) Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Organization, 314 Albert St., East Melbourne C2, Victoria, Australia.

GENERAL:

"Food and Agriculture in 1984: The Race Will Not Yet Be Won," by R. B. Sen; "Farming as a Science-Based Industry," by William Slater; "Beware the Malnutrition of Affluence," by John Yudkin, articles, New Scientist, vol. 21, no. 376; January 30, 1964, pp. 270-273, illus., printed, single copy 1s. 3d. (about 20 U. S. cents). Cromwell House, Fulwood Pl., High Holborn, London WC1, England. A symposium on the subject of accomplishments to be expected in the fields of food and agriculture within the next 20 years. Factors which must be considered in estimating what may be achieved are: (1) the effect of technical progress on crop and livestock yields; (2) the effect of rising population on the intensity of cultivation which in turn affects crop and livestock yields; and (3) the possibility of increasing production through the development of new land resources. Agricultural resources can be supplemented by a very great increase in the production of fish. If, by 1984, the less developed countries can double their agricultural output, they will be ready to move into a more advanced form of agriculture with larger units and mechanization in the remaining years of the century, and so meet the needs of the greater population increase which is expected by 2000 A. D. By 1984,

it is probable that scientists will have enough information about the factors which determine food choice to ensure that they know how to bridge the gap between wide food availability and appropriate consumption.

GERMAN FEDERAL REPUBLIC:

Die Versorgung mit Fischen, Schal- und Krustentieren in der Bundesrepublik in den Wirtschaftsjahren 1959/60 bis 1961/62. Teil I--Versorgungsbilanzen (The Supply of Fish, Shellfish, and Crustacea in the Federal Republic during Fiscal Years 1959/60 through 1961/62. Part I--Balance of Supply), by Otto Bauer; Teil II--Verbrauch und Nährwertzusammensetzung (Part II--Consumption and Composition of Nutritional Value), by Willi Wirths, 28 pp., illus., printed in German. (Reprinted from Berichte über Landwirtschaft, vol. 41, no. 4, 1963, pp. 741-768.) Verlag Paul Parey, Spitalerstrasse 12, 2000 Hamburg 1, Germany.

GRADING:

"Fresh-Water Fish Grading Equipment," by A. W. Lantz, article, Progress Reports of the Biological Station and the Technological Unit, Fisheries Research Board of Canada, no. 2, May 1961, pp. 53-56, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

HALIBUT:

Pacific Halibut Fishery Regulations (Effective March 18, 1964), 13 pp., printed. International Pacific Halibut Fishery Commission, Fisheries Hall No. 2, University of Washington, Seattle 5, Wash. The regulations for the North Pacific halibut fishery were published in conformity with the Pacific Halibut Fishery Convention between the United States and Canada, signed March 2, 1953. The new regulations cover the regulatory areas; length of halibut fishing seasons; closed seasons; catch limits in Areas 2, 3A, 3B South, and 3B North Triangle; size limits; licensing of vessels; retention of halibut taken under permit; conditions limiting validity of permits; and statistical return by vessels. They also concern statistical return by dealers; dory gear prohibited; retention of halibut taken by nets; retention of tagged halibut; responsibility of master; supervision of unloading and weighing; sealing of fishing equipment; and previous regulations superseded.

HERRING:

"Change of the Fact Factor in White Sea Herring in Connection with the State of the Sexual Products," by G. A. Bogdanov, article, Chemical Abstracts, vol. 57, October 29, 1962, 11685g, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Smasild- og Feitsildtokt med F/F G.O. Sars i Tiden 15 September til 10 Oktober 1963" (Small Herring and Fat Herring Exploratory Cruise on Board R/V G. O. Sars between September 15 and October 10, 1963), by Olav Dragesund, article, Fiskets Gang, vol. 50, no. 3, January 16, 1964, pp. 48-53, illus., printed in Norwegian. Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

INDIA:

Fish Technology News Letter, vol. IV, no. 4, January 1964, 12 pp., processed. Central Institute of Fisheries Technology, Ernakulam, India. Includes, among others, "Canning of Tuna in Oil;" "Sampling of Frozen

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Fish Products;" "Fishery Products of Commerce. I--Shark Fins;" "Pasteurization of Peeled Prawns;" "Salmonella Organisms in Fish Meal;" and "A Comparative Account of the Rotting Resistance of Netting Twines of Vegetable Origin."

INSULIN:

"Studies on Insulin. III--On the Structure of the Amino Acid Chain of Bonito Insulin," by Akira Kotaki, article, *Journal of Biochemistry*, vol. 51, April 1962, pp. 301-309, printed. Charles E. Tuttle Co., 28-30 Somers St. Rutland, Vt.

INTERNATIONAL COMMISSIONS:

(International North Pacific Fisheries Commission) Proceedings of the Tenth Annual Meeting, 1963, 254 pp., illus., processed, February 28, 1964. International North Pacific Fisheries Commission, 6640 NW Marine Dr., Vancouver 8, B.C., Canada. Presents the minutes of sessions and committee reports of the meeting held at Vancouver, Canada, November 18-23, 1963, and summary minutes of an informal session of the Commission held in Tokyo, Japan, on October 4, 1963.

ISRAEL:

Bamidgeh, vol. 15, no. 4, December 1963, 32 pp., illus., printed. Bamidgeh, Nir-David D.N., Israel. Contains these articles: "Current Problems in Fish Culture," by S. Tal; "Fisheries and Fish Culture in Israel in 1962," by S. Sarig; and "Ten Years of Research in Fish Ponds Fertilization in Israel. 2--Fertilizers Dose and Frequency of Fertilization," by B. Hepner.

JAPAN:

Bulletin of the Japanese Society of Scientific Fisheries, vol. 29, no. 10, October 1963, 77 pp., illus., printed in Japanese with English abstracts. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan. Contains, among others, articles on: "Chronographical Life Record Curve Method for Identifying Each Stock of Pelagic Fishes. V--Identification of Sardine Stocks in Coastal Waters of Hokkaido," by Hideaki Yasuda, Kichie Kaga, and Ryosuke Hayano;

VI--Identification of Sardine Stocks in the Pacific Coast of Honshu and Kyushu," by Hideaki Yasuda and Kazuhiko Minowa; "Experimental Use of Fish Pumps in Various Phases of Fisheries. III--Causes for Damage of Shellfish Collected by Pumping," by Yozo Tawara and others. "Fish Schools Attracted by Light Stimuli Observed in the Operation of Hasso-Ami or Eight-Boat-Lift-Net," by Makota Inoue; "Spawning Experiments of the Common Squid, *Ommastrephes sloani pacificus* Steenstrup in an Indoor Aquarium," by Mototsugu Hamabe; and "Feed Efficiency of Fish Meal. I--Relation between Oxidation and Feed Efficiency of Fish Meal; II--Digestibility of Fish Meal Treated with Various Solvents," by Kuman Saruya and others.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 29, no. 11, November 1963, 98 pp., illus., printed in Japanese with English abstracts. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan. Includes, among others, articles on: "Studies on Reproduction of Rainbow Trout, *Salmo gairdneri*, with Special Reference to Egg Taking.

V--Development of Gonads and Size of Fish Spawning Firstly," by Minoru Nomura; "Serological Identification of Breeding Subpopulations of Fin Whales Taken from the Gulf of Alaska and the West Coast of British Columbia," by Kazuo Fujino; "Manometric Studies on the Respiration of a Marine Alga, *Porphyra tenera*. II--Influence of Some Growth Substances, Nitrogen Compounds and Reappraisal of the Influence by Drying and pH," by Eizi Ogata and Toshio Matsui; "Distribution Pattern of Sharks Along Setline" (in English), by Hiroshi Maeda; "On the Growth Effect of Vitamin A in Fish Liver Oil on Chicken (in English), by Haruo Baba; "Studies of the Effects of Marine Products on Cholesterol Metabolism. I--The Effects of Edible Seaweeds," by Takashi Kaneda, Setsuko Tokuda, and Kimie Arai; and "Discoloration of Lyophilized Fish," by Masamichi Toyomizu, Fusetsu Orita, and Yukio Tomiyasu.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 29, no. 12, December 1963, 130 pp., illus., printed in Japanese and English. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan. Contains, among others, these articles: "Catch Pattern of Squids under Lamp, in Relation to Quantity of Catch," by Hiroshi Maeda and Yutaka Nakada; "Identification of Breeding Subpopulations of the Sperm Whales in the Waters Adjacent to Japan and Around Aleutian Islands by Means of Blood Typing Investigations," by Kazuo Fujino; "Behaviour of Sweep Line in Danish Seining. I," by Otohiko Suzuki; "Studies on Bacterial Loan of Fish Container. II--On the Fate of Takikawa's So-Called Pathogenic Halophilic Bacteria Invaded into Materials of Wooden Container; III--Disinfection of Wooden Fish Container Polluted with Takikawa's So-Called Pathogenic Halophilic Bacteria," by Akiya Kurogi.

Fisheries Cooperatives Law, 50 pp., printed in Japanese. Fisheries Agency, Tokyo, Japan.

Fishery Vessel Insurance Statistics, 33 pp., illus., printed in Japanese. Japanese Fishery Agency, Tokyo, Japan.

Fishing Vessels Loss Compensation Law and Related Regulations, 277 pp., printed in Japanese, reprinted July 1963. Fisheries Agency, Tokyo, Japan.

Journal of the Faculty of Fisheries and Animal Husbandry, Hiroshima University, vol. 5, no. 1, December 1963, 278 pp., illus., printed in Japanese and English. The Faculty of Fisheries and Animal Husbandry, Hiroshima University, Fukuyama, Japan. Includes, among others, these articles: "Relationship between Tidal Range and Catch of Pound Net in Kasaoka Bay," by Shumpei Kakuda; "On Four Newly Known Species of Octopoda from Japan," by Iwao Taki; "Note on the Fishing Condition of the Yellow Tail Set Net Fishery in the Tohoku, Tokai and Nankai Sea Regions of Japan," by Sadaichi Nishikawa; and "Chemical Studies on Fish Solubles. I--Vitamin Contents and Amino Acid Composition of Commercial Fish Solubles," by Keiji Ito and Shiro Sato.

Mutual Aid Regulations No. 1--Fire Mutual Aid Regulations, 22 pp., printed in Japanese. National Fisheries Cooperatives Mutual Aid Association, Tokyo, Japan.

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Mutual Aid Regulations No. 2--Welfare Mutual Aid Regulations, 66 pp., printed in Japanese, revised August 1, 1963. National Fisheries Cooperatives Mutual Aid Association, Tokyo, Japan.

Statistic Tables of Fishing Vessels (as of the End of 1962), General Report No. 15, 308 pp., illus., printed in Japanese and English. Japanese Fisheries Agency, Tokyo, Japan. An annual report containing statistical data in detail on the various types of Japanese fishing craft, both powered and nonpowered, as obtained by a fishery registration system. The statistics seem to show that the Japanese fishing fleet has not only restored its prewar status but increased its capacity rapidly after World War II.

LINGCOD:

Glycolysis in Lingcod Muscle during Frozen Storage, by N. Tomlinson, R. E. E. Jonas, and S. E. Geiger, Reprint No. 752, 8 pp., printed. (Reprinted from Journal of the Fisheries Research Board of Canada, vol. 20, no. 5, 1963, pp. 1145-1152.) Technological Research Laboratory, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

MARINE AIDS:

Light List, vol. 1--Atlantic Coast, St. Croix River, Maine to Little River, South Carolina, 562 pp., illus., printed, 1964, \$3.50. U. S. Coast Guard, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A light list for the northern and central Atlantic Coast of the United States was issued recently by the U. S. Coast Guard. Contains locations of lights, fog signals, buoys, daybeacons, lightships, radio-beacons, and loran stations from St. Croix River, Maine to Little River, South Carolina. Areas covered include the First, Third, and Fifth Coast Guard Districts. Intended to furnish more complete information concerning aids to navigation than can be conveniently shown on charts. Not intended to be used in navigation in place of charts and coast pilots.

MARINE RESOURCES:

"Oceans in 1984: New and Richer Marine Harvests Forecast," by Alister Hardy; "Working Deep in the Sea," by Edwin A. Link; "A Long View from the Beach," by Roger Revelle, articles, New Scientist, vol. 21, no. 379, February 20, 1964, pp. 482-487, illus., printed, single copy 1s. 3d. (about 20 U. S. cents). Cromwell House, Fulwood Pl., High Holborn, London WC1, England. A symposium on the subject of accomplishments to be expected in the development of marine resources within the next 20 years. By 1984, the world's food supply should be greatly increased as a result of the growth of fish-farming facilities and the harvest of krill, a planktonic shrimp, for human consumption. Man will be able to travel to the ocean's depths to work at such tasks as oil drilling, mining, fish culture, or the garnering of undersea crops. Scientists can expect changes in fish populations as the result of warmer ocean currents in some areas; control of weather as a product of increased knowledge of the influence of the ocean's energy potential on the evolution of hurricanes; and even the "taming" of porpoises in consequence of an understanding of their behavior.

MARKETING:

"Fishmen Angle for Two Fridays," article, Business Week, no. 1798, February 15, 1964, pp. 74-75, 77, illus., printed, 50 cents. McGraw-Hill, Inc., 330 W. 42nd St., New York, N. Y. 10036. Currently the fish-and shellfish-processing industry is mounting a campaign to create more appetite for its products. It's counting heavily on improved processing, more "heat and eat" items. There is even a drive on to erase the restrictiveness of the "fish on Fridays" habit. The search for new markets is focused largely on institutions and overseas.

MENHADEN:

Menhaden--Natural Resource from the Pastures of the Sea, 15 pp., illus., printed. Public Relations Branch, Industrial Products Division, National Fisheries Institute, 1614 20th St. NW., Washington, D. C. Describes with the help of many photos, the menhaden; physiological and chemical properties of menhaden meal, oil, and solubles; the menhaden fleet and its operations; processing of the catch at the plants; biological research on this species; uses of menhaden products in feeds, fertilizers, margarine, paints, and other products; and the use of spotter planes in the fishery.

METABOLISM:

"Influence of Environment on the Metabolism of Iodine in Fish," by Cleveland P. Hickman, Jr. (University of Alberta, Edmonton, Canada), article, Chemical Abstracts, vol. 57, October 15, 1962, 10368d, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

MEXICO:

Foreign Trade Regulations of Mexico, OBR 64-27, 8 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.) Mexico's industries and their domestic markets are protected by high tariffs and import controls. Two exceptions, however, to the restrictive trade policy exist: in the northwest, some industrial and consumer goods are being imported free of duty under special customs provisions; and in regard to other members of the Latin American Free Trade Association, Mexico grants exclusive tariff and trade control preferences. The report discusses Mexico's trade policy, import tariff system, documentation and fees, labeling requirements, and special customs provisions. Also covers nontariff import trade controls, Mexico's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

Labor Law and Practice in Mexico, BLS Report No. 240, 76 pp., illus., printed, November 1963, 45 cents. Bureau of Labor Statistics, U. S. Department of Labor, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses Mexico's geographic setting, manpower resources, culture and customs, education and health, and government in relation to labor. Also covers industrial relations; pay and allowances; hours of work and premiums; safety,

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insurance, and services; and employment practices. Included are statistical tables showing data on gross national product; labor force, by age group, economic sector, industry, class of worker, and occupational group; average weekly wages of manual workers; and other similar information.

MOLLUSCS:

Deoxyribonucleic Acids of Marine Mollusca, by Michael Smith and D. B. Quayle, Reprint No. 756, 2 pp., printed. (Reprinted from *Nature*, vol. 200, no. 4907, November 16, 1963, p. 676.) Technological Research Laboratory, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

MUSSELS:

El Mejillon como Primera Materia para la Conserva (The Mussel as Raw Material for Canning), by Buenaventura Andreu, 7 pp., illus., printed in Spanish. (Reprinted from *Informacion Conservera*, no. 119-120, November-December 1963.) *Informacion Conservera*, Colon, 62, Valencia, Spain.

NEWFOUNDLAND:

Newfoundland Fishing, by John Corlett, Laboratory Leaflet (New Series) No. 1, 20 pp., illus., processed, December 1962. Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, England. Discusses history of the Newfoundland fisheries, hydrography and ice, cod stocks and fishing, cod catch and effort, haddock, ocean perch and flounder, and effect of fishing and future prospects.

NEW JERSEY:

Fish and Game Laws of New Jersey, 1964 and until Repealed, 221 pp., printed. Division of Fish and Game, Department of Conservation and Economic Development, P.O. Box 1809, Trenton, N.J. 08625.

NEW ZEALAND:

Foreign Trade Regulations of New Zealand, by Maurice E. Birch, OBR-64-4, 12 pp., printed, 15 cents, January 1964. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C., 20402.) The Government's import policy is aimed at using its foreign exchange for either essential producer goods to expand the economy or for non-locally manufactured consumer items. This report discusses trade policy, import tariff system, sales and other internal taxes, documentation and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, New Zealand's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

NORWAY:

Arsmelding og Rekneskap for Noregs Sildesalslag, 1963 (Annual Report and Accounts for Norwegian Winter Herring Sales Organization, 1963), 48 pp., printed in Norwegian, 1963. Noregs Sildesalslag, Bergen, Norway.

Arsmelding og Rekneskap for Sild- og Brisling-Salslaget, 1962 (Annual Report and Accounts for Norwegian Small and Fat and Sprats and North Sea Herring Sales Organization, 1962), 44 pp., printed in Norwegian. Sild- og Brisling-Salslaget, Bergen, Norway.

Fiskeflaten, 1962 (Fishing Fleet, 1962), *Arsberetning Vedkommende Norges Fiskerier 1962--No. 13*, 31 pp., illus., printed in Norwegian, 1963. Fiskeridirektoren, Bergen, Norway.

Fiskeristatistikk 1961 (Fishery Statistics 1961), 87 pp., illus., printed in Norwegian with English preface, table of contents, and summary, June 12, 1963. Fiskeridirektoratet, Bergen, Norway.

Norway Exports, no. 3, Autumn 1963, 89 pp., illus., printed. Export Council of Norway, H. Heyerdahls Gate 1, Oslo, Norway. A few facets of Norway's processing of fish are spotlighted in this issue. In particular, the progress of the fish-canning industry is reported, and likewise the cod-liver oil industry. Considerable space is devoted to packaging of various types and also to packaging materials, particularly paper and board. Fishing vessel research, development of sonar fish-detection equipment and echosounders, and production of fishing nets and lines are also emphasized.

"Toktprogram 1964" (Exploratory Cruise Program for 1964), article, *Fiskets Gang*, vol. 50, no. 4, January 23, 1964, pp. 65-72, printed in Norwegian. *Fiskets Gang*, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

Trawling Prospects Off West Norway, by Peter Woodhead, Laboratory Leaflet (New Series) No. 4, 20 pp., illus., processed, September 1963. Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, England. Describes the results of fishing and echo surveys by the R/V *Ernest Holt* on the banks off West Norway, principally Svinoy and Halten Banks. Catches consisted mostly of coalfish and "spurdogs." There is also information from German and Norwegian sources.

OCEANOGRAPHY:

"Britain's National Institute of Oceanography," by Victor K. McElheny, article, *Science*, vol. 144, no. 3615, April 10, 1964, pp. 160-163, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

Denkschrift Zurlage der Meeresforschung (Memorandum on the Status of Oceanographic Research), by Gunther Bohnecke and Arwed H. Meyl, 131 pp., illus., printed in German, 1962. Franz Steiner Publishing Firm, Wiesbaden, Germany. Includes chapters on international oceanographic organizations, tasks of individual research disciplines in oceanography, the present situation of research institutions engaged in oceanography in the Federal Republic, a description of a new research ship and a fold-in diagram showing her compartmentation.

The International Indian Ocean Expedition: A Status Report, by Irvin E. Wallen, 9 pp., illus., printed. (Reprinted from the *Journal of the Washington Academy of Sciences*, vol. 54, 1964, pp. 45-53.) Museum of Natural History, Smithsonian Institution, Washington, D. C. 20560. Out of the International Geodetic Year (IGY) of 1957-58, grew the Special Committee of Oceanic Research (SCOR), parent organization of the International Indian Ocean Expedition (IIOE). A member of SCOR had suggested that over an appropriate period of

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time many ships should visit the Indian Ocean, making standard observations and collecting data for a detailed description of its physical, chemical, biological, and geological characteristics. The Indian Ocean was chosen because it possesses unique geographical, meteorological, and hydrographic features, and also because little oceanographic research had been conducted there prior to 1957. Participants presently include 20 countries. The United States is represented by 14 vessels and 5 aircraft sponsored by Government and private agencies. Five shore stations in Madagascar and India cooperate with the expedition in administrative, logistic, and research matters. The Inter-Governmental Oceanographic Commission in Paris has responsibility for international interchange of published data. In addition to diverting vessels of American oceanographic institutions from research programs in the Atlantic or Pacific Oceans, the United States also has converted two vessels for use during the IIOE. One of these is the Te Vega, a two-masted steel-hulled schooner; the other is the Anton Bruun, formerly the Presidential yacht, Williamsburg, designated principal research vessel for biological oceanography in IIOE. In addition to routine determinations of physical and chemical characteristics of the sea water, and plankton sampling, the latter vessel undertakes other special projects. Intensive sampling with Gulf shrimp trawls, Isaacs-Kidd midwater trawls, gill nets, long lines, dip nets, aqualungs, and other devices assist in an evaluation of the fishery potential in the Indian Ocean. The distribution of adult tunas, marlins, and sharks are being studied by the U. S. Bureau of Commercial Fisheries in relation to water temperature and ocean circulation during the two monsoon seasons. The biological specimens collected are partially sorted on board the vessels, where they are preserved, carefully packed, and sent to the Smithsonian Oceanographic Sorting Center in Washington, D. C. At the end of 1963, over one million specimens, including 17,427 species of fish from 133 families, had already been sorted for further study.

"The Oceans and the Future," by Anthony Harrigan, article, Navy, vol. 7, no. 4, April 1964, pp. 6-10, illus., printed, single copy 25 cents. Navy League of the U. S., Mills Bldg., Washington, D. C. 20006. To view contemporary sea power in proper perspective, it is essential to consider the changing value of seaspace and the contents of the oceans, according to the author. The central point to consider is the unprecedented rise in the world's population. Where as sea power once was necessary to invasion of land areas, nations in the near future, if they are to feed their populations, must be sure of the harvests of the oceans. The nations will turn more and more to the seas for food, oil, water, and minerals as population pressures mount.

OREGON:

Foodfish for the Future, by Charles P. Selden and Irving W. Jones, Educational Bulletin No. 1, 22 pp., illus., printed, 1958. Fish Commission of Oregon, 307 State Office Bldg., 1400 SW. 5th Ave., Portland, Ore. 97201. Discusses the types of food fish caught in Oregon waters--salmon, bottomfish, albacore tuna, crabs, and clams; management of the fishery resources by the State Fish Commission; and initiation

of fishery management program by research biologists. Also covers putting management programs into action, operation and goals of salmon hatcheries, and importance of awareness by the public of fishery conservation programs.

OTOLITHS:

Role of Otoliths in Taxonomic Analysis of Fish, USSR, by D. K. Khalturin, OTS 64-21244, 6 pp., printed, January 9, 1964, 50 cents. (Translated from the Russian, Doklady Akademii Nauk SSSR, vol. 152, no. 2, 1964.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

OYSTERS:

"Biochemical Studies on Ostrea gigas, X--On the Seasonal Variations of the Distribution of Copper and Zinc in Various Organs," by Akira Hayashi Kinki University, Fuse, Osaka, Japan, article, Chemical Abstracts, vol. 57, August 20, 1962, 5133e, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

Measurement of Shell Growth in Oysters by Weighing in Water, by Jay D. Andrews, Contribution No. 110, II pp., illus., processed. (Reprinted from Proceedings of the National Shellfisheries Association, vol. 52, 1961.) Virginia Institute of Marine Science, Gloucester Point, Va.

PERCH:

Perch Anatomy, a film, (16 minutes, sound, color or black and white). Audio Visual Center, Indiana University, Bloomington, Ind. Functions of external perch anatomy in relation to the environment; and dissection of the fish, illustrating digestive, excretory, circulatory, reproductive, and central nervous systems.

PESTICIDES:

"Pesticides--In Our Ecosystem," by Frank E. Egler, article, American Scientist, vol. 52, no. 1, March 1964, pp. 110-136, illus., printed. Single copy \$1. Sigma Xi. 51 Prospect St., New Haven, Conn.

PHILIPPINES:

Establishing a Business in the Philippines, by Kenneth A. Guenther, OBR 64-11, 16 pp., printed, February 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A report offering information helpful to United States citizens interested in organizing a business in the Philippines, was released recently by the U. S. Department of Commerce. To attract foreign capital the government has adopted a generally favorable investment policy. The major step in the creation of this policy was the removal of restrictions, early in 1962, on dividends, royalty and sundry remittances, and the repatriation of capital. The report discusses U.S. commercial interests in the Philippines, Government policy concerning foreign investments, business organization, and registry and bookkeeping requirements. Also covers trademarks and patents, labor and employment, taxation, bidding procedures for government procurement, and chambers of commerce.

PHYSIOLOGY:

"Psychophysics and Hearing in Fish," by William N. Tavolga, article, Natural History, vol. LXXIII, no. 3,

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March 1964, pp. 34-41, illus., printed, single copy 50 cents. The American Museum of Natural History, Central Park W. at 79th St., New York, N. Y., 10024.

POLAND:

Zjednoczenie Gospodarki Rybnej, 1964 (Fisheries Central Board, 1964), 41 pp., illus., printed in Polish and English. Zjednoczenie Gospodarki Rybnej, Swietokrzyska 12, Warsaw, Poland. This attractively illustrated booklet offers information on the status of the Polish fishing industry. Covers, in tabular form, development of the post-war fishing fleet; total landings, 1938-1961; fishing enterprises; fish-processing plants; wholesalers, retailers, and exporters; and scientific institutes and other institutes incorporated in the Fisheries Central Board. Also discusses briefly fisheries cooperatives, scope of the fishery export trade, the engineering company for refrigeration and mechanization of fisheries, and fisheries schools.

PREDATORS:

Spotlight on the American Whelk Tingle, by D. A. Hancock, Laboratory Leaflet (New Series) No. 2, 11 pp., illus., processed, December 1962. Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Burnham-on-Crouch, Essex, England.

PROTEINS:

"Comparison of the Efficiencies of Free Lysine and of Roller-Dried Skim Milk, Fish Protein, and Soybean Protein for the Supplementation of Wheat Bread," by L. E. Ericson, S. Larsson, and G. Lid (Royal Institute of Technology, Stockholm Sweden), article, Chemical Abstracts, vol. 58, June 10, 1963, 13053d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Proteins from Petroleum Reported by Esso, BP," article, Oil, Paint and Drug Reporter, vol. 182, December 17, 1962, p. 5, printed. Schnell Publishing Co. Inc., 30 Church St., New York, N.Y. 10007.

"Studies on a Herring-Egg Phosphoprotein," by T. E. Barman, Nguyen-kim Bai, and Nguyen-Van Thoi, article, The Biochemical Journal, vol. 90, no. 3, March 1964, pp. 555-558, illus., printed, 40s. (\$6.75 in the United States). Cambridge University Press American Branch, 32 E. 57th St., New York, N. Y. 10022.

QUALITY:

"Studies on the Browning of Fish Flesh. X--Change of Reflectance by Heat Treatment," by Fumio Nagayama and Kimihiro Sano, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, August 1962, pp. 828-832, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minatoku, Tokyo, Japan.

RADIATION PRESERVATION:

"Recent Research on Food Preservation by Ionizing Radiation in Germany," by U. Schutzack, article, Food Irradiation, vol. 3, April-June 1963, pp. A22-A25, printed. Interdepartmental Committee on Radiation Preservation of Food, U. S. Department of Commerce, Washington, D. C. 20230.

RADIOACTIVITY:

"Accumulation of Radioactive Strontium and Yttrium in Eggs of Marine Fish," by G. G. Polikarpov and V. N. Ivanov (Biological Station, Academy of Science, U.S.S.R.), article, Chemical Abstracts, vol. 57, October 15, 1962, 10370h, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

REFRIGERATION:

Kholodil'naia Tekhnika, no. 1, 1964, 80 pp., illus., printed in Russian with English table of contents. Kholodil'naia Tekhnika, Ul. Kostyokova 12, Moscow I-434, U.S.S.R. (For sale by the Four Continent Book Corp., 822 Broadway, New York, N. Y. 10003.) Includes, among others, these articles: "Utilization of Polymer Films when Freezing and Storing Fish," by G. S. Konokotin and L. P. Zuikova; and "Ammonia Pump Circulation Cooling System of Reconstructed Fish Cold Store in Poti," by V. I. Matveyev.

RESEARCH VESSEL:

"To Sea in a Saucer," article, Business Week, no. 1798, February 15, 1964, pp. 88-89, 92, 94, illus., printed, 50 cents. McGraw-Hill, Inc., 330 W. 42nd St., New York, N. Y. 10036. The Cousteau diving saucer, designed by the man who invented the Aqualung, can submerge to 1,000 feet with safety and still provide a large degree of freedom. The saucer, which looks like a squashed ellipsoid, is less than 10 feet in diameter and about 5 feet thick. Propelled by two water jets powered by batteries, the vessel carries a pilot and an observer.

SALMON:

Abundance, Size and Age of Red Salmon Smolts from the Wood River System, 1963, by Michael L. Nelson, Informational Leaflet 37, 22 pp., illus., processed. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska.

Bristol Bay Red Salmon, 1963--A Compilation of the Catch and Escapement Data, edited by Donald B. Siniff, Informational Leaflet 35, 185 pp., illus., processed. Department of Fish and Game, Subport Bldg., Juneau, Alaska.

Forecast Research on 1964 Alaskan Pink Salmon Fisheries, by Wallace H. Noerenberg and others, Informational Leaflet 36, 55 pp., illus., processed, March 10, 1964. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska. In 1963, the Department of Fish and Game expanded research on Alaska's most important species, pink salmon, O. gorbuscha (Walbaum), into Southeastern Alaska, Cook Inlet, and Kodiak areas on the basis of work done since 1960 in Prince William Sound. Thus, the most important production areas came under study; packs of pink salmon in those areas accounted for over 53 percent of the total Alaska salmon pack of all species in 1963, and 47 percent in 1962. The primary objective of the present pink salmon research program is forecast of annual runs in each area. Accurate forecasts, within 20 percent of actual returns, will make it possible to manage and harvest the major pink salmon stocks far more efficiently, regardless of whether they are at high or low levels of production. The definition of optimum escapement, maximum sustained yield, and

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effects of logging are being studied where possible as secondary projects under the forecast program. This report discusses results of research in the four areas and presents statistical tables showing data on parent escapement, outmigration of salmon fry, catches, population densities, and other information.

Olfactory Perception in Migrating Salmon. III--Stimulants for Adult Sockeye Salmon (ONCORHYNCHUS NERKA) in Home Stream Waters, by U. H. M. Fagerlund and others, Reprint No. 755, 7 pp., printed. (Reprinted from Journal of the Fisheries Research Board of Canada, vol. 20, no. 6, 1963, pp. 1457-1463.) Technological Research Laboratory, 6640 NW. Marine Dr., Vancouver 8, B. C.

2-Phenoxyethanol as a General Anaesthetic for Sockeye Salmon, by H. S. Sehdev, J. R. McBride, and U. H. M. Fagerlund, Reprint No. 754, 6 pp., illus., printed. (Reprinted from Journal of the Fisheries Research Board of Canada, vol. 20, no. 6, 1963, pp. 1435-1440.) Technological Research Laboratory, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

SARDINES:

"Determination of Vitamin K₂ in the Portuguese Sardine," by A. Forjaz, L. Brito, and L. Manso (Instituto Portugueso Conservas Peixe, Lisbon, Portugal), article Chemical Abstracts, vol. 54, July 25, 1960, 14494d, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

SHARKS:

"Sodium Chondroitin Sulfate-Protein Complexes of Cartilage. III--Preparation from Shark," by Mark B. Mathews (University of Chicago), article, Chemical Abstracts, vol. 57, August 6, 1962, 3764d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

Sound Perception in Elasmobranchs, by W. J. Wisby and others, Contribution No. 493, 14 pp., illus., printed, 1964. (Reprinted from Marine Bio-Acoustics--Proceedings of a Symposium Held at Bimini, Bahamas, April 1963, pp. 255-268.) The Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla. Results of a study to determine hearing function of sharks and other elasmobranchs. Discusses the sensory organs--labyrinth, lateral line, and ampullae of Lorenzini; unconditioned and conditioned responses to low-frequency sounds; field tests of the attraction of sharks to sounds of a struggling fish; and future plans for research in that field.

SHRIMP:

Freezing Preservation of the Shrimp. Development of This Industry in Morocco. Trials on the Value of Certain Substances Used as Additives in Freezing, by P. Chaponneau, 30 pp., printed. These Veterinaire, Ecole Nationale Veterinaire, d'Alfort No. 3, Paris, France.

SMALL BUSINESS MANAGEMENT:

The Use of Consultants by Manufacturers, by David C. Eley and W. David Robbins, Management Research

Summary, 2 pp., processed, 1963. Small Business Administration, Washington, D. C. 20416. The study on which the report is based shows an increasing use of management consultants by manufacturers in recent years. The results indicate that some firms have developed the art of utilizing consultants proficiently, while others are quite unsuccessful. From depth interviews with 75 firms, it was learned that where management had recognized that a problem existed and sought the assistance of a consultant, the consulting experience was usually quite satisfactory. The report includes fundamental principles for selection and successful use of consultants, as well as the basic causes for failure in consulting experience.

SMOKING:

"Electrostatic Smoking," article, Food Engineering, vol. 35, August 1963, p. 54, printed. Chilton Co., Chestnut and 56th St., Philadelphia 36, Pa.

"Influence on the Method of Smoke Generation on the 3,4-Benzopyrene Content in Smoke and Smoked Fish," by O. P. Gretskaia and others, article, Rybnoe Khoziaistvo, vol. 38, no. 3, 1962, pp. 56-62, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow, U.S.S.R.

SOUTH AFRICA REFUBLIC:

Fisheries Development Corporation of South Africa Limited--Nineteenth Annual Report (Covering Period 1st October, 1962, to 30th September, 1963), 16 pp., printed in Afrikaans and English, February 14, 1964. Fisheries Development Corporation of South Africa Ltd., Seafare House, 68 Orange St., Cape Town, South Africa Republic. Presents brief reports on the state of the pilchard, maasbanker, mackerel, and spiny lobster fisheries; and activities of the Corporation. For the first time in 6 years, landings by the inshore fisheries of South Africa and South West Africa showed a slight decline.

SPAIN:

"Exportacao Galega de Conservas de Peixe em 1962" (Galician Exports of Canned Fishery Products in 1962), article, Conservas de Peixe, vol. XVIII, no. 214, January 1964, pp. 18-19, 21-22, printed in Portuguese. Sociedade da Revista Conservas de Peixe, Lda., Regueirao dos Anjos, 68, Lisbon, Portugal.

"Informe sobre Evolucion del Comercio Interior de Productos Pesqueros en 1963 (Report on Development of Domestic Trade in Fishery Products in 1963), article, Boletin de Informacion, no. 64, January 1964, pp. 15-16, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6^a Planta, Madrid, Spain.

SPINY LOBSTER:

A Industria da Lagosta Espinhosa na Africa Austral (Um Estudo Economico) (The Spiny Lobster Industry in Southern Africa--An Economic Study), by Domingos Jose Soares Rebelo, 16 pp., printed in Portuguese with English summary. (Reprinted from Boletim da Sociedade de Estudos de Mocambique, vol. 32, no. 135, April-June 1963, pp. 65-83.) Sociedade de Estudos da Provincia de Mocambique, Lorenzo Marques, Mozambique.

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STANDARDS:

"AFDOUS: Association of the Food and Drug Officials of the United States," article, Quick Frozen Foods, vol. 24, March 1962, pp. 195-196, 198, 200, 202-210, printed. E. W. Williams Publications Inc., 82 Wall St., New York, N. Y. 10005. A complete publication of the AFDOUS frozen food handling code including: plant construction and layout; equipment design and construction; operating practices for processing as well as retail, transportation, and warehouse handling of frozen foods.

SWORDFISH:

Development of Long-Line Fishing of Swordfish in the U. S. and Canada, with Some Emphasis on Its Effect on the U. S. Swordfish Fish Market, by Ryoichi Aoki, 15 pp., printed in Japanese, December 15, 1963. Japan Frozen Food Exporters' Association, Tokyo, Japan.

TAGGING:

The Tagging of Fishes in Florida, 1962 Program, by Robert Topp, Professional Papers Series No. 5, '82 pp., illus., printed, December 1963. Florida State Board of Conservation, Marine Laboratory, St. Petersburg, Fla.

Tagging Reef Fishes in the Virgin Islands, by John E. Randall, Contribution 362, 41 pp., illus., printed. (Reprinted from Proceedings of the Gulf and Caribbean Fisheries Institute, Fourteenth Annual Session, November 1961, pp. 201-241.) The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

TENNESSEE VALLEY AUTHORITY:

Fish and Wildlife, Valuable Natural Resources, TVA, 12 pp., illus., printed, 1964. Fish and Wildlife Branch, Tennessee Valley Authority, Norris, Tenn.

TROUT:

"Studies on Lipids of Wild Rainbow Trout," by Yachihiro Shimma and Hisako Taguchi, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, January 1962, pp. 55-60, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

TUNA:

Brine Spray Frozen Tuna, Sodium, Potassium, Lactic Acid and Acid-Soluble Phosphorus in the Muscle, and the Influence Thereon of Thawing and Precooking, by N. Tomlinson and S. E. Geiger, Reprint No. 753, 5 pp., printed. (Reprinted from Journal of the Fisheries Research Board of Canada, vol. 20, no. 5, 1963, pp. 1183-1187.) Technological Research Laboratory, 6640 NW. Marine Dr., Vancouver 8, B.C., Canada.

Catch Locality, Fishing Effort, and Length-Frequency Data for Albacore Tuna Landed in Oregon, 1951-60, by Robert J. Ayers and James M. Meehan, Investigational Report No. 2, 187 pp., illus., processed, August 1963. Fish Commission of Oregon, Research Division, Clackamas, Oreg. By comparing environmental changes with variations in albacore fishing success it may be determined whether these changes are responsible for fluctuations in seasonal appearance, distribution, and relative abundance of albacore.

This report is a compilation of catch and fishing effort data for Oregon albacore landings which may be compared with the information compiled on the oceanic environment. Statistical tables and graphs present data on sampling intensity for the Oregon albacore fishery, 1951-60; Oregon albacore landings by year, month, and port; percent of total Oregon landings assigned to one-degree blocks, 1951-60; albacore catches by year; length frequencies for landings at Astoria, Coos Bay, and Newport, by year and month; catch localities by month; and length-frequency distribution by month.

Report of a Survey for Tuna in Western Australian Waters, by J. S. Hynd and D. Vaux, Report 37, 133 pp., illus., processed, 1963. Commonwealth Scientific and Industrial Research Organization, Division of Fisheries, Marine Laboratory, Cronulla, Australia. This is a report of tuna explorations carried out in waters off the southwestern corner of Australia, from July 31, 1961, to July 17, 1962; biological examination was made of almost all fish taken (chiefly southern bluefin, *Thunnus maccoyii*); and hydrographical observations were made. Although the survey plans provided for fishing on a commercial scale whenever fish were found, only one small catch was taken and landed; the rest of the catch, consisting entirely of small fish, was used for tagging and other biological purposes. The presence of three groups of tuna was demonstrated. Conclusion was that it is unlikely that the type of vessel used would be able to make successful fishing in this area by the pole-and-bait method.

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. XII, no. 1, January 1964, 35 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G. M., Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, articles on: "A simple Current-Measuring Bottle for Fishermen;" "Some Chemical Investigations on the Horse Mackerel Which are Caught in Black Sea;" and "Basic Researches on the Development of Fishery in Turkish Freshwaters, Lakes and Dams (Part I)."

Labor Law and Practice in Turkey, BLS Report No. 239, 76 pp., illus., printed, March 1963, 45 cents. Bureau of Labor Statistics, U. S. Department of Labor, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington D. C. 20402.) Discusses Turkey's geographic setting, manpower resources, culture and customs, education and health, and government in relation to labor. Also covers industrial relations; pay and allowances; hours of work and premiums; safety, insurance, and facilities; and employment practices. Included are statistical tables giving data on population, by province, chief cities, and age group; distribution of labor force, by economic sector, and occupation; average earnings, by economic section; and other related information.

TURTLES:

"The Fate of the Sea Turtles," by John Hillaby, article, New Scientist, vol. 20, no. 371, December 26, 1963, pp. 776-777, illus., printed, single copy 1s. (about 15 U. S. cents). Cromwell House, Fulwood Pl., High Holborn, London WC1, England. No other animals

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are more efficient at converting seaweed and other marine products into highly palatable eggs and meat than the sea turtles, but unless the present method of exploitation is rapidly changed the turtles seem doomed to extinction.

UNITED KINGDOM:

Fisheries of Scotland Report for 1962, Cmnd. 2022, 126 pp., illus., printed, 8s. 6d. (about US\$1.30). Department of Agriculture and Fisheries for Scotland, Aberdeen, Scotland. (Available from Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland.) Discusses principal accomplishments in the Scottish fisheries during 1962; means of capture and persons engaged--fishing fleet, number of fishermen, grants and loans to fishermen for purchase of vessels and gear; herring fisheries; whitefish fisheries; shellfish fisheries; and miscellaneous items--Outer Hebrides fisheries training program, byproducts production, and meteorological assistance. Also covers marine superintendence--coastal patrols, prosecutions for illegal trawling, seining, and other offences, and Trawling in Prohibited Areas Prevention Act, 1909; salmon fisheries--catch, value and employment, closed seasons, district boards, poaching and illegal fishing, drift-net fishing, and damage by seals to the fishery; fisheries research projects; and harbors--grants and loans for harbor improvement, and dredging. Appendices present statistical tables and explanatory material on herring distribution and disposal of landings; herring landings by area; methods of capturing herring; and whitefish--quantity and average price by species, fishing areas, landings by method and district, and foreign landing. Also included are information on salmon fisheries--annual closed seasons, details of catch, and report of Inspector; fisheries research--report of Director, and activities of Scottish Marine Biological Association laboratories; construction and improvement of harbors; and fisheries administration.

Foreign Trade Regulations of the United Kingdom, by Edward A. Leslie, OBR 64-14, 8 pp., printed, February 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A report of value to businessmen interested in import-export trade with the United Kingdom. Since World War II, British tariffs have been gradually reduced on most products as a result of a series of multilateral negotiations held under the auspices of the General Agreement on Tariffs and Trade (GATT). The United Kingdom is an active member of the GATT, the Organization for Economic Cooperation and Development (OECD), and the European Free Trade Association (EFTA). The report discusses Britain's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, British export controls, United States export and import controls, and diplomatic representation between the two countries.

U.S.S.R.:

Developments in Fisheries of USSR, OTS 64-21431, 27 pp., illus., printed, January 30, 1964, 75 cents. (Translated from the Russian, Nauchno-Tekhnicheskii

Byulleten' PINRO, nos. 1 and 4, 1962.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

Recent Developments in Soviet Ichthyology, OTS 63-41336, 84 pp., illus., printed, \$2.25, December 11, 1963. (Translated from the Russian, Voprosy Ikhtiologii, vol. 3, no. 3 (28), 1963.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

Roe Size-Dependent Fish Fertility, Fresh Water Fish Distribution, and Parasitofauna of Pond-Raised Carp, USSR, OTS 64-21210, 42 pp., illus., printed, January 3, 1964, \$1.25. (Translated from the Russian, Voprosy Ikhtiologii, vol. 1, no. 2 (19), 1961.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

Soviet Studies on Fish, OTS 64-21480, 80 pp., illus., printed, February 4, 1964, \$2. (Translated from the Russian, Trudy Instituta Ikhtiologii i Rybnogo Khozyaystva Akademii Nauk Kazakhskoy SSR, vol. 4, 1963.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

WASHINGTON:

Washington State Department of Fisheries, 1962 Annual Report, edited by Don Reed, 210 pp., illus., printed, Washington State Department of Fisheries, Rm. 115, General Administration Bldg., Olympia, Wash. Includes information on the activities of the Department of Fisheries during 1962 in salt-water research--chinook tagging, Puget Sound salmon fisheries, ocean sport fishery, Puget Sound herring fisheries, Bellingham Bay water quality study, otter-trawl fisheries, and 1962 troll season; and fresh-water research--prolonged fresh-water residence of juvenile fall chinook salmon, sonar fish counter, impoundment rearing study, and Columbia River scrapfish control study. Sections are also included on engineering and construction, fish farms, Columbia River fisheries, coastal investigations, power dam studies, stream improvement, sport salmon fishery during 1962, fisheries law enforcement, and reimbursable contract services program. Specialized problems are dealt with in chapters on the oysters projects, clam rearing, Willapa Bay shellfish management, coastal pink shrimp fishery, razor clam fisheries in 1962, fish feeding at hatcheries, egg takes at hatcheries, adult escapement to hatchery racks, and fish planted from State salmon hatcheries in 1962. A considerable portion of the report is devoted to 1962 fisheries statistics on commercial landings and fishway counts.

WEATHER CHARTS:

The following processed weather charts are published by the Weather Bureau, U. S. Department of Commerce, Washington, D. C., and are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, 10 cents each. Charts show stations displaying small craft, gale, whole gale, and hurricane warnings; explanations of warning displays; and schedules of AM and FM radio, TV, and radiophone stations that broadcast weather forecasts and warnings.

Coastal Warning Facilities Chart, Eastern Florida, 1964.

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Coastal Warning Facilities Chart, Point Conception, Calif. to Mexican Border, 1964.

WHALE MEAT:

"Utilization of Whale Meat in Sausage Manufacture," by G. Babin and V. Gorbatov, article, Chemical Abstracts, vol. 58, January 7, 1963, 875f, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

WHALES:

"Sperm Whale Chase," by K. Godfrey, article, Fisheries Newsletter, vol. 23, no. 2, February 1964, pp. 14-15, 17, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra, Australia. A 2-year survey of sperm whale resources off the West Australian coast is being undertaken by the Commonwealth Scientific and Industrial Research Organization's Division of Fisheries and Oceanography under a £24,000 grant made by the Minister for Primary Industry from the Fisheries Development Trust Account. Aerial spotting, which will provide a substantial part of the information needed, started in April 1963, and this article describes some aspects of that work.

WHALING:

Verslag over het Zeventiende Boekjaar Lopende van 1 Juli 1962-30 Juni 1963 (Report of the Netherlands Whaling Company for the Fiscal Year July 1, 1962-June 30, 1963), 13 pp., printed in Dutch. Nederlandse Maatschappij voor de Walvisvaart N. V., Amsterdam, Netherlands.

"Value of Whale Products Falls," by D. J. Gates, article, Fisheries Newsletter, vol. 23, no. 2, February 1964, pp. 16-17, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra, Australia. Estimated value of whale oil and byproducts in 1963 was £512,000, compared with £1,006,000 in 1962. Total number of whales taken was 686 (88 baleen, 598 sperm), 623 fewer than in the previous season. The International Whaling Commission (of which Australia is a member) meeting in July 1963 agreed that 3 species of baleen whales, the blue, fin, and humpback, should be further protected, and in regard to humpback whales agreed to prohibit their capture for an indefinite period in all waters south of the equator.

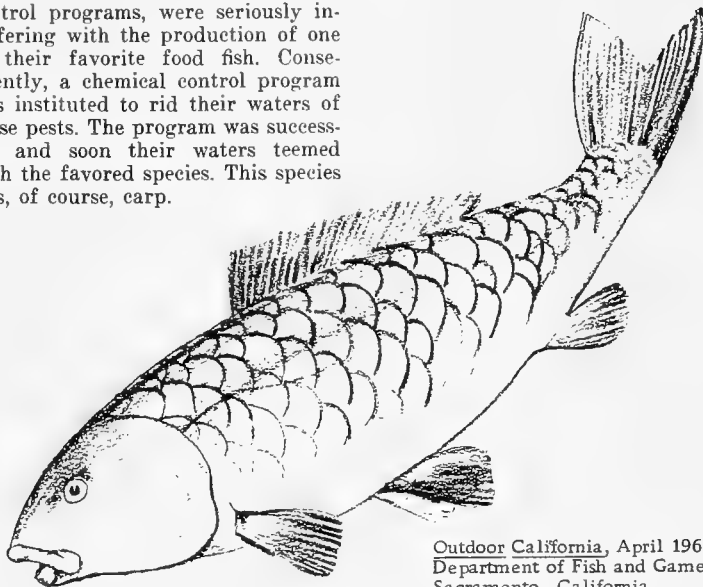


A Difference in Philosophy

The introduction of carp into North America during the late 1800's is viewed by most anglers and fishery managers as a mistake of gigantic proportions. During the intervening years, carp and similar species—generally classed as "trash fish"—have been the objects of extensive, expensive, and often futile eradication campaigns. Even small numbers of carp in favorite trout and bass waters evoke demands from anglers to "do something" to get rid of them. In this country, then, the carp is damned, despised, and destroyed.

A brief note in a recent issue of *The Progressive Fish Culturist* is of particular interest since it dramatically illustrates the differences in outlook between East and West. In India, a country badly in need of animal protein, fishery workers were having problems—as they seem to have all over the world. Mosquitofish, the same species so popular in

the United States for use in mosquito control programs, were seriously interfering with the production of one of their favorite food fish. Consequently, a chemical control program was instituted to rid their waters of these pests. The program was successful and soon their waters teemed with the favored species. This species was, of course, carp.



Outdoor California, April 1963
Department of Fish and Game
Sacramento, California

THE METAL FOOD CONTAINER AS THE REGULATORY OFFICIAL SEES IT

The very ruggedness of the metal container for packing food can lead to problems, says George P. Larrick, Commissioner of Food and Drugs, U. S. Department of Health, Education, and Welfare, in an address presented at the National Cannery Convention, Dallas, Texas, February 4, 1964. Excerpts from the talk follow:

"It is the very ruggedness of the metal container--the familiar tin can--which, because it is taken so much for granted, can lead to problems that I have been invited to comment upon. Our inspection of canning plants raises the question in our minds whether too much dependence is sometimes put in the ruggedness and fool-proof nature of cans. We see instances during the shipment, unloading, and conveying of empty cans and the subsequent handling of filled cans where the cans are treated so roughly that we wonder if they will be able to perform properly their function of maintaining an airtight and bacteria-tight barrier around their food contents. For example, cans are to an increasing extent being shipped jumble-packed in bulk containers, dumped into high speed unscramblers, and moved up, down and around by fast conveyors. There are many opportunities for them to come into violent contact with each other and with other objects. If the impact occurs on the lip of the can, may not a distortion occur that will result in an imperfect double seam when the lid is applied?

"Coming from the doubler seamer, cans are often allowed to fall into retort baskets or onto conveyor tracks in such a way that, we fear, the newly formed double seam or some other portion of the can may be ruptured or bent. The break in the integrity of the seal may be only momentary under the force of the impact, but this can be particularly dangerous if it occurs after processing and cooling when the can is rolling along wet, nonsterile, or even insanitary surfaces where contaminated droplets of water may be sucked in during the temporary rupture.

"The hazards are multiplied as the speed of can-closing operations is increased and as labor-saving machinery replaces manual procedures. We are sure you agree that repeated reappraisals of safeguards are necessary to reduce and keep such hazards to a minimum.

"Improvements in can manufacturing technology have inevitably introduced other factors that invite a close look. New techniques of tin-plating yield thinner protective coatings of tin over the base metal. It is our understanding that the coatings are more uniform and have fewer imperfections, but possibly do not offer as great protection against mechanical injury or chemical attack by certain food products as did the old, heavier, hot-dipped platings. The canner now has a wide range of metal base plates and weights of tin coatings from which to choose for packing his products. Generally this choice is made with the assistance of the can company scientists who know best the chemical and physical characteristics of the various types of cans and which ones are best adapted to the food product under consideration.

"New methods of fabricating the steel base plate have resulted in a thinner and lighter plate which may be less able to withstand rough handling, but we are also told such plate is more highly tempered and more likely to fracture as it is rolled into the tight angles that result when double seams are formed with the thinner plate.

"The situation is sometimes complicated by the use of lids made from tin plate differing from that of the can body in thickness, temper, and weight of coating. In other instances lacquered ends are used with plain bodies, and perhaps vice versa. This brings up again the possibility of faulty seals and nonsterile cans. It also stresses the need for frequent and careful examinations of double seams by trained specialists in the cannery to see that closing machines have the proper seaming rolls, chucks, etc., and are kept in proper adjustment.

(Continued on next page)

"In the past, as regulatory officials we have felt a measure of reassurance in the belief that if the seams were faulty and the can leaked and became nonsterile, nothing worse than ordinary spoilage with obvious souring or gas formation would occur. This would be a financial loss to the packer, but posed no health hazard to the consumer who, even if the spoiled can reached her hands, would recognize its condition and reject it. The occurrence of Type E botulism in canned tuna last year, resulting in two deaths, fully demonstrated the danger that may lurk in cans with imperfect seals, for this appears to have been an important factor in that case. We have become convinced that we must now improve our own efforts to assure consumer protection against such rare occurrences.

". . . It is, of course, the canner's responsibility, as well as in his own interest, to maintain a close inspection of his empty and his closed cans to see that such injury does not occur and to spot and correct circumstances that make it likely. One of the points that our inspections are designed to cover will be the attention that the cannery gives to this matter. Other points will include the sanitary condition of can runways and the chlorine content of cooling water. . . .

"In conclusion, let me commend the industry, can-makers, and canners alike, on their record of producing billions of cans of safe, high-quality foods. At the same time I bespeak your continued care and watchfulness lest that splendid record be marred. Today, from a public relations point of view, one serious error in one plant can react to the great harm of an entire industry regardless of their over-all excellence."



RADIATION AND FOOD

Consumers are hearing more and more about foods treated with some form of "radiation" to preserve them, or to kill insects or insect eggs, or to prevent sprouting, or to accomplish some other purpose.

They have begun to ask the U. S. Food and Drug Administration (FDA) questions about such "irradiated" foods.

How safe is radiation-processed food? Under the requirements of the Food Additives Amendment of 1958, any food treated by irradiation must be proved safe to the satisfaction of FDA scientists before it can be legally marketed.

The irradiation of two foods, namely canned bacon and bulk wheat, has already been approved by FDA, and petitions for irradiation of a number of other foods are currently under consideration or may be expected soon.

Clearance for the irradiation processing of canned bacon and bulk wheat was based on the evaluation of extensive data submitted by the U. S. Army Quartermaster Research Organization and others. The data included animal feeding studies conducted over many years which conclusively established that the irradiated foods under consideration are as wholesome and nutritious as conventionally-processed foods. Other data show that these foods, irradiated according to approved processes, do not become radioactive and do not retain any lingering activity from irradiation. ("FDA Memo for Consumers," U. S. Food and Drug Administration, February 19, 1964.)

EDIBLE CRABS

Crabs are members of the Crustacea, a class of the great invertebrate phylum Arthropoda, animals with jointed legs and a hardened outer covering, or exoskeleton. Most crustaceans are aquatic animals, and one of the distinguishing characteristics of the class is that they breathe by means of gills. The members of the other classes of Arthropoda, such as the insects, spiders, and centipedes, are essentially terrestrial animals. Crustaceans are the arthropods that often swarm in the sea as the insects swarm on land, and there is hardly a way of life in the sea not followed by some member of this diversified class.



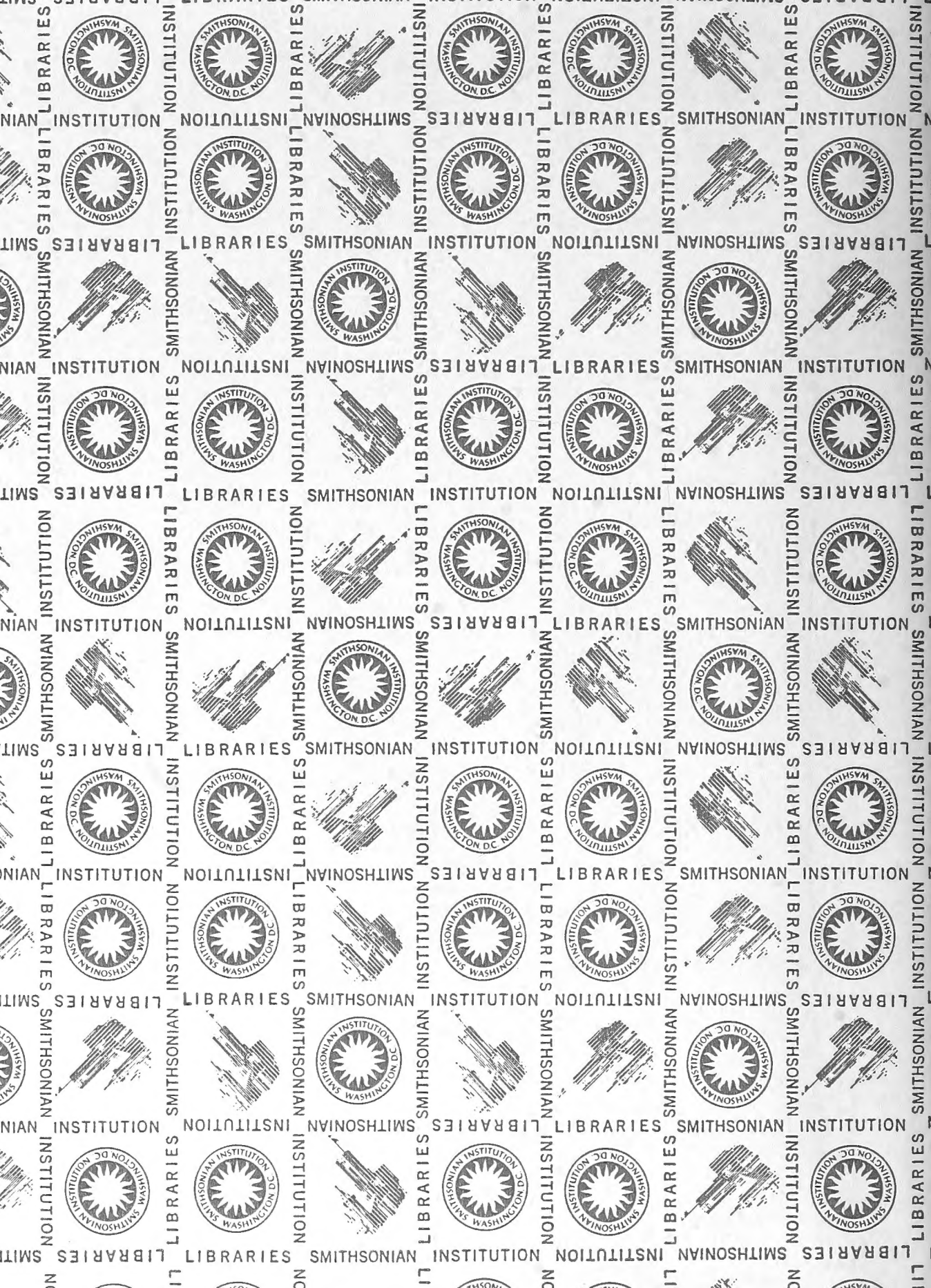
There are many orders in the class Crustacea. Crabs belong to the order Decapoda, a name which refers to the fact that the members of this order have five pairs of legs. Some other familiar decapods are shrimp, crayfish, and lobster. The order is further divided into suborders, and all the true crabs are placed in the suborder Brachyura. The name is quite appropriate for this group, for the abdomen, or tail, is a shortened flap that is folded under the body. The suborder Anomura also contains a number of species that are commonly called crabs because of similarities in structure and habits to the true crabs. The members of this order have a somewhat reduced abdomen which is not as permanently flexed under the body as in the Brachyura.

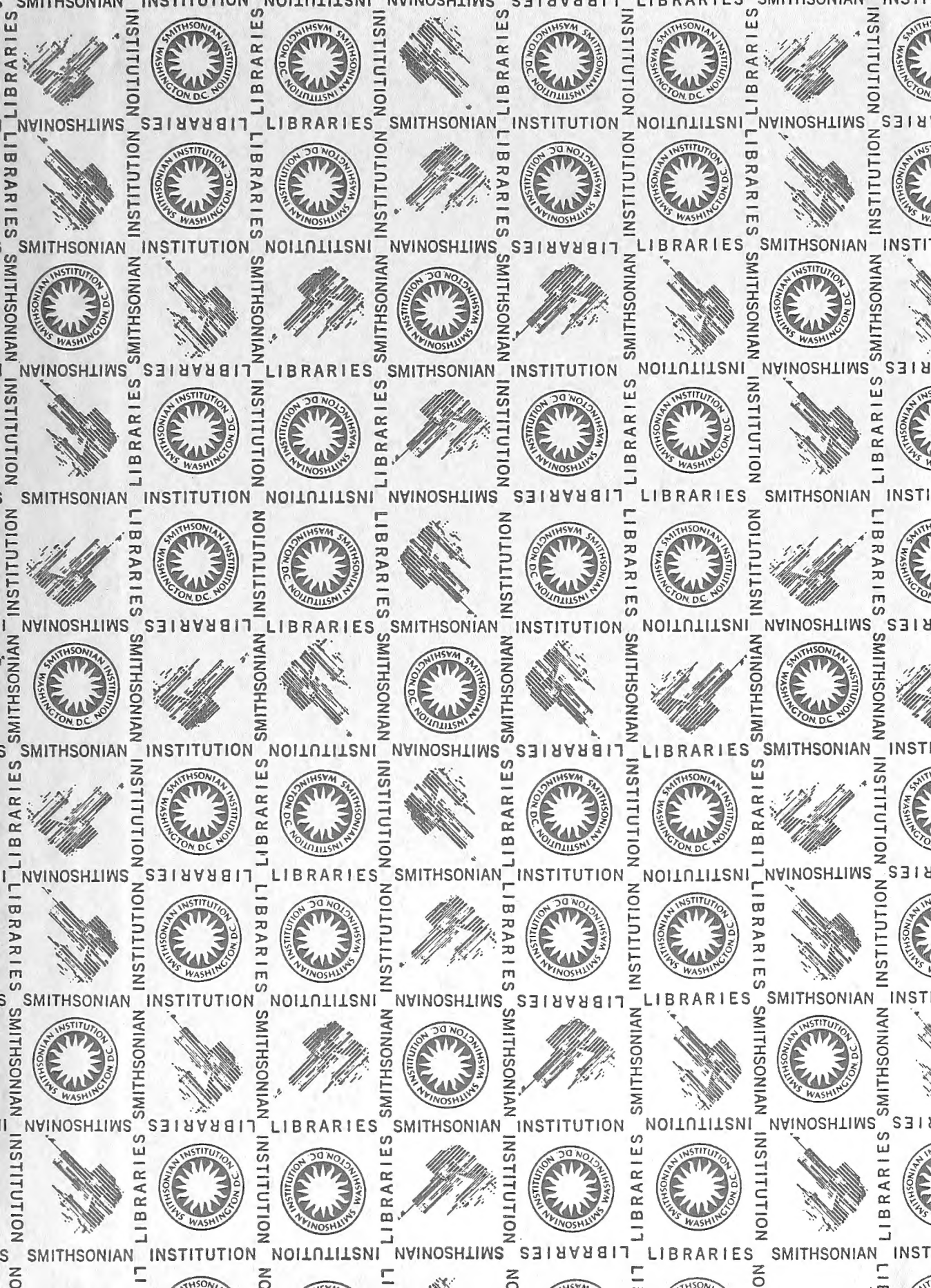
Hermit crabs are probably the most familiar anomurans, but one very important commercial species, the king crab of Alaska, is also a member of that order.

All crabs possess five pairs of legs, and the first pair is always chelate, that is, equipped with pincers. In one group of crabs, the swimming crabs, the end segments of the last pair of legs are flattened. These flattened segments are used as sculling organs and enable the crabs to swim rapidly.

The true crabs range in size from some not larger than a grain of wheat to others that are the largest known crustaceans. A record specimen of the giant spider crab of Japan (*Macrocheira kaempferi*) measured $12\frac{1}{2}$ feet between the outstretched claws. That giant crab has very long, slender legs, and the body of the animal measures about 15 inches across.

--"Edible Crabs of the United States,"
Fishery Leaflet 550,
U. S. Bureau of Commercial Fisheries,
Washington, D. C. 20240.





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