



## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.  
 FL - FISHERY LEAFLETS.  
 SL - BRANCH OF STATISTICS LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.  
 SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).  
 SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-2155	Mississippi Landings, August 1959, 2 pp.
CFS-2171	Fish Meal and Oil, October 1959, 2 pp.
CFS-2174	Massachusetts Landings, September 1959, 5 pp.
CFS-2176	Mississippi Landings, September 1959, 2 pp.
CFS-2182	Alabama Landings, September 1959, 2 pp.
CFS-2183	Georgia Landings, October 1959, 2 pp.
CFS-2186	Florida Landings, October 1959, 6 pp.
CFS-2188	Maine Landings, October 1959, 3 pp.
CFS-2189	New York Landings, October 1959, 4 pp.
CFS-2190	Texas Landings, October 1959, 3 pp.
CFS-2198	North Carolina Landings, November 1959, 4 pp.
CFS-2200	Ohio Landings, October 1959, 2 pp.
CFS-2201	New Jersey Landings, November 1959, 3 pp.
CFS-2205	Pacific Coast States Fisheries, 1958 Annual Summary, 6 pp.
CFS-2206	South Carolina Landings, November 1959, 2 pp.
CFS-2207	Georgia Landings, November 1959, 2 pp.
CFS-2209	Frozen Fish Report, November 1959, 8 pp.
CFS-2210	Fisheries of the United States and Alaska, 1958 Annual Summary, 15 pp.
CFS-2211	Rhode Island Landings, October 1959, 3 pp.
CFS-2216	Florida Landings, November 1959, 6 pp.
CFS-2218	Ohio Landings, November 1959, 2 pp.
CFS-2219	Rhode Island Landings, November 1959, 3 pp.
FL-471	Edible Crabs, by Charles H. Walburg, 4 pp., illus., 1959 (Revision of FL-71, July 1945).
FL-487	Spiny Lobster Gear and Fishing Methods, by C. E. Cope, 20 pp., illus., June 1959. Describes the spiny lobster fishery in the Florida

area. Includes details of boats and deck fittings used, current gear and methods, former gear and methods, and approximate costs of spiny lobster gear (1959). Some excellent drawings accompany the text.

SL-107 - Firms Canning Fish and Shellfish Specialties, 1958 (Revised), 5 pp.

SL-162 - Firms Producing Fish Sticks and Portions, 1959 (Revised), 2 pp.

SSR-Fish. No. 289 - Counts of Red Tide Organisms, Gymnodinium breve, and Associated Oceanographic Data from Florida West Coast, 1954-57, by John H. Finucane and Alexander Gradovich, 224 pp., illus., March 1959.

SSR-Fish. No. 297 - Lake Superior Limnological Data, 1951-57, by Alfred M. Beeton, James H. Johnson, and Stanford H. Smith, 183 pp., illus., April 1959.

SSR-Fish. No. 305 - Stream Catalog of Eastern Section of Ketchikan Management District of Southeastern Alaska, by John Wilson Martin, 398 pp., illus., April 1959. Stream descriptions, maps, historical records, and salmon escapement data are compiled for 117 salmon streams in the eastern section of the Ketchikan fishery management district. Each stream is located geographically by latitude and longitude, and by orientation to prominent land masses. The species of salmon utilizing the spawning grounds and estimates of the escapement magnitude each year for many years are given.

SSR-Fish. No. 306 - Reclamation of Indian and Abrams Creeks in Great Smoky Mountains National Park, by Robert E. Lennon and Phillip S. Parker, 26 pp., illus., May 1959.

SSR-Fish. No. 311 - Bristol Bay Oceanography, August-September 1938, by Felix Favorite and Glenn Pedersen, 35 pp., illus., August 1959.

SSR-Fish. No. 316 - Lethal Doses of Several Commercial Chemicals for Fingerling Channel Catfish, by Howard P. Clemens and Kermit E. Sneed, 11 pp., September 1959.

SSR-Fish. No. 317 - Age Size Composition of the Menhaden Catch Along the Atlantic Coast of the United States, 1952-55 (with a Brief Review of the Commercial Fishery), by Fred C. June and John W. Reintjes, 70 pp., illus., August 1959. Includes a brief description of menhaden purse-seine fishing gear, methods, and seasons; a summary of the major features of the 1955 Atlantic Coast purse-seine fishery; a description and analysis of the methods of sampling the catches; and tabular data resulting from the catch-sampling program.

SSR-Fish. No. 319 - Effect of Field Polarity in Guiding Salmon Fingerlings by Electricity, by H. William Newman, 18 pp., illus., September 1959.

Sep. No. 578 - The Pound-Net Fishery in Virginia: Part 2 - Species Composition of Landings Reported as Menhaden.

Sep. No. 579 - Possibilities for Applying Fish Oil to Ore Flotation.

Sep. No. 580 - Research in Service Laboratories (February 1960): Contains these articles-- "Composition of Fish and Shellfish;" "Control of Drip in Chilled and Frozen Fishery Products;" "Fish Flour Research;" "Low Storage Temperatures Help Maintain Fillet Quality;" "Proposed Standards for Grades of Frozen Raw Headless Shrimp under Review;" and "Purified Fish-Oil Fractions to be made Available for Research."

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-4	Newfoundland's Fishing Industry, 20 pp.
MNL-5	Danish Fisheries, 1959, 12 pp.
MNL-6	Mexico's Fish and Shellfish Canning Industry, 1958, 23 pp.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE NOT FOR GENERAL DISTRIBUTION BUT ARE AVAILABLE FOR REFERENCE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

Attempts at Estimating the Abundance of Fish Population from the Data of Tuna Long-Line Fishery. I--A Few Considerations on the Variations in Distribution of Catch per 1,000 Hooks, by Akira Suda, English translation, 15 pp., processed. (Translated from Report of Nankai Regional Fisheries Research Laboratory, no. 7, 1958, pp. 105-126.)

Comparison Between Survey Map by 14.5 Kc. Fish-Finder and That by 200 Kc. Fish-Finder with Sharp Beam on Same Area, by Tomiju Hashimoto and Yoshinobu Maniwa, English translation, 5 pp., processed. (Translated from Technical Report of Fishing Boat, no. 12, October 1958, pp. 149-155.)

The Daily Vertical Migration of Pelagic Fish, by S. G. Zusser, English translation, 32 pp., processed. (Translated from Behavior of Fish and Commercial Exploration, V.N.I.R.O., Trudy v. 36, pp. 83-105.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

California Fishery Products Monthly Summary, November 1959; 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish, mackerel, anchovies, and sardines; pack of canned tuna, mackerel, anchovies, and sardines; market fish receipts at San Pedro, Santa Monica, and Eureka

areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna Boat Association auction sales; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, November and December, 1959, 6 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) 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; sponge sales; and imports at Port Isabel and Brownsville, Tex.; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, December 1959, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and 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; for the month indicated.

New England Fisheries--Monthly Summary, November 1959, 24 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish 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 landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for October 1959, 23 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the month indicated.

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, November and December 1959, 8 and 9 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.), wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the months indicated.

Federal Administration of the Fishery Industries of Alaska, by C. Howard Baltzo, 11 pp., November 1959. (U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Box 2481, Juneau, Alaska.) A term-end report on Alaska's commercial fisheries and the accomplishments of the U. S. Bureau of Commercial Fisheries in their development. Covers the historical background of the Alaska fisheries; the development of the salmon, halibut, sablefish, herring, clam, shrimp, and crab industries; and latent fisheries such as bottomfish, cod, oysters, and whaling. Discusses the historical role of Government administration in the Alaska fisheries and functions such as fishery research, river basin studies, technology, exploratory fishing, and vessel loans. Since Alaska has now achieved Statehood, the responsibility for control and regulation of the fishery conservation program was assumed by the Alaska Department of Fish and Game at Juneau on January 1, 1960.

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Changes in Tuna Landings of the Hawaiian Long-line Fishery, 1948-1956, by Richard S. Shomura, Fishery Bulletin 160 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 87-106, illus., printed, 20 cents, 1959. This study was undertaken to determine the cause of a change in species dominance in the catch of the Hawaiian long-line fishery from yellowfin to big-eyed tuna during the period 1948-49. The available commercial catch records showed that the reversal in species resulted from a shift by the larger vessels of the fleet from fishing grounds in the leeward waters of the northern islands to grounds located in the windward waters of the southern islands.

Contributions of Hudson and Connecticut Rivers to New York-New Jersey Shad Catch of 1956, by Kenneth J. Fischler, Fishery Bulletin 163 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 161-174, illus., printed, 20 cents, 1959.

Early Development and Metamorphosis of the Ten-Pounder, ELOPS SAURUS Linnaeus, by Jack W. Gehringer, Fishery Bulletin 155 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 59), pp. 619-647, illus., printed, 30 cents, 1959.

"Experimental Introductions of Fresh-Water Alewives," by Robert E. Vincent, article, The Progressive Fish-Culturist, vol. 22, no. 1, January 1960, pp. 38-42, processed, single copy 25 cents.

Food of the Pacific Sardine (SARDINOPS CAE - RULEA), by Cadet H. Hand and Leo Berner, Jr., Fishery Bulletin 164 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 175-184, illus., printed, 15 cents, 1959.

The Goldeye, AMPHIODON ALOSOIDES (Rafinesque), in the Commercial Fishery of the Red Lakes, Minnesota, by Marvin D. Grosslein and Lloyd L. Smith, Jr., Fishery Bulletin 157 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 33-41, illus., printed, 15 cents, 1959.

"Improvements in a Microprojector for Fish Scales," by Elmer S. Phillips and Dwight A. Webster, article, The Progressive Fish-Culturist, vol. 22, no. 1, January 1960, pp. 24-29, illus., processed, single copy 25 cents.

Variability of Skipjack Response to Live Bait, by Heeny S. H. Yuen, Fishery Bulletin 162 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 147-160, illus., printed, 20 cents, 1959. In this study, observations made from commercial skipjack live-bait fishing boats, operating from Honolulu, revealed that catch rates for each school of skipjack had a general pattern; the rates rose to a peak and then declined with elapsed fishing time. Peak catch rate and duration of fishing after the peak were selected as measures of biting response and were compared with data on location, the weather, time of day, and stomach contents. Large skipjack feeding on fast-swimming fish seemed to show a better response to chum (live bait) than did those feeding on slow-swimming fish.

## 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 ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### ALGAE:

Notes on Algae of Quebec, by Lewis H. Flint, Bulletin No. 19, printed. Service de Biogéographie, University of Montreal, Montreal, Canada.

### AMINO ACIDS:

"The Free Amino-Acids of Fish. II--Fresh Skeletal Muscle from Lemon Sole (Pleuronectes microcephalus)," by N. R. Jones, article, Journal of the Science of Food and Agriculture, vol. 10, May 1959, pp. 282-286, printed. The Society of Chemical Industry, 14 Belgrave Square, London S. W. 1, England.

### ANIMAL FEED:

Animal Feed from Herring Waste, by Friedrich Jahn, East German Patent No. 11,819, June 23, 1958. Patent Office, German Democratic Republic, East Berlin, Germany.

### ANTIBIOTICS:

"K Metodike Prigotovleniia Biomitsinovogo L'da" (Method of Preparing Biomycin Ice), by E. A. Smotriaeva, article, Rybnoe Khoziastvo, no. 3, March 1958, pp. 53-56, printed in Russian. Rybnoe Khoziastvo, Four Continent Book Corporation, 822 Broadway, New York 3, N. Y. To obtain uniform distribution of antibiotics in ice, tests have been conducted with biomycin (similar to aureomycin) prepared in U.S.S.R. Antibiotic ice can be prepared in blocks and flakes. Flake ice is more convenient to use, for in quick freezing of a thin layer of water the antibiotic is more uniformly distributed. In unequal distribution of the antibiotic, small doses of it, found in individual sections of the block, stimulate the action of microflora instead of suppressing

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it. In this work, agaroid was used to aid uniform distribution of biomyacin.

"A New Fluorometric Determination of Chlorotetracycline in Ice, by Tetuo Tomiyama and Yasuo Yone, article, Food Technology, vol. 13, July 1959, pp. 370-373, printed. Food Technology, The Garrard Press, 510 North Hickory, Champaign, Ill.

"Opyt Primeneniia Biomitsina Dlia Sokhraneniia Svezhei Ryby" (Test on the Application of Biomyacin for Preserving Fresh Fish), by E. A. Smotrieva and others, article, Rybnoe Khoziaistvo, no. 12, December 1958, pp. 49-51, printed in Russian. Rybnoe Khoziaistvo, Four Continent Book Corporation, 822 Broadway, New York 3, N. Y. During 1956-1957 tests were carried out on the application of biomyacin in preserving fresh sprats and cod. Sprats were immersed in an aqueous solution of biomyacin, 50 mg./liter concentration and preliminary-cooled to 0° C. The fish was removed from the bath after 5 minutes and covered with crushed biomyacin ice. A second group of fish, cooled in ice water and overspread with ordinary ice, served as control. After ice melted, the fish was kept at +5° C. Microbiological analysis, after 8-day storage, showed that titration in culture of test fish was a million times less than in control fish. Also, that nitrogen content of volatiles in the test fish was half of that in the controlled.

#### BIOCHEMISTRY:

"Determination of Trimethylamine Oxide in Fish Muscle," by J. Bystedt, L. Swenne, and H. Q. Aas, article, Journal of the Science of Food and Agriculture, vol. 10, June 1959, pp. 301-304, printed. The Society of Chemical Industry, 14 Belgrave Square, London S. W. 1, England.

#### BIOLOGICAL RESEARCH:

"Effect of Unsaturated Acids and Fish Oils on Plasma and Tissue Lipides from Hypercholesteremic Rats," by James J. Peifer and W. O. Lundberg, article, Federation Proceedings, vol. 18, part I, March 1959, p. 300, printed. Federation of American Societies for Experimental Biology, 9650 Wisconsin Ave., N. W., Bethesda, Md.

#### CALIFORNIA:

Sportfishing Regulations and Law Digest, 1959, 31 pp., illus., printed. California Department of Fish and Game, 722 Capitol Ave., Sacramento, Calif.

#### CANADA:

The Canadian Fish Culturist, no. 25, October 1959, 59 pp., illus., printed. The Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains the following articles: "The Effect on Fisheries of Man-Made Changes in Fresh Water in the Maritime Provinces," by A. L. Pritchard; "The Effects on Fisheries of Man-Made Changes in Fresh Water in the Province of Quebec," by Vadim D. Vladykov; "The Effects of Power, Irrigation, and Stock Water Developments on the Fisheries of the South Saskatchewan River," by R. M. Miller and M. J. Paetz; and "The Effects on Freshwater Fisheries of Man-Made Activities in British Co-

lumbia," by P. A. Larkin and others. The above papers were presented at a symposium on "The Effects on Fisheries of Man-Made Changes in Fresh Waters," held during the eleventh meeting of the Canadian Committee on Fresh Water Fisheries Research, sponsored by the Fisheries Research Board of Canada in association with the annual meeting of the Board, January 3, 1958.

"Survey of Saskatchewan Fisheries," by J. E. Steen, article, Trade News, vol. 12, no. 5, November 1959, pp. 3-5, illus., processed. Director of Information and Educational Service, Department of Fisheries, Ottawa, Canada. A detailed discussion of the fisheries of Saskatchewan, the third largest fresh-water fishery in Canada. In 1958, more than 11 million pounds of fish, with a record market value of C\$2 million, were landed in the waters of this western province. According to the author, the accelerated demand for fish in the United States is chiefly responsible for the increase in production in recent years. About 75 percent of Saskatchewan's catch is exported to the U. S. --only about 10 percent is consumed locally and the remainder is sold to other Canadian markets. Nearly 135 lakes in the province are fished commercially, with whitefish the principal species landed. Problems of transportation have been the chief difficulty in marketing the province's fish. Shipping by air in recent years has helped to solve these problems. The province's fisheries are administered by the Fisheries Branch of the Saskatchewan Department of Natural Resources. The Branch has aided the industry by such work as encouraging the development of mink ranches near lakes, control of carp, and the introduction of new and more commercially-valuable species into provincial waters.

#### CHILE:

Decreto con Fuerza de Ley No. 34 de 12 de Marzo de 1931 Sobre Pesca (Decree with Force of Law No. 34 of March 12, 1931 on Fishing), 11 pp., processed in Spanish. Ministerio de Agricultura, Direccion General de Produccion Agraria y Pesquera, Departamento de Fomento de Pesca y Caza, Valparaiso, Chile.

Informaciones Estadísticas sobre Pesca, Años 1955, 1956, 1957 (Statistical Data on Fisheries, Years 1955, 1956, 1957), 67 pp., illus., processed in Spanish. Ministerio de Agricultura, Direccion General de Produccion Agraria y Pesquera, Departamento de Fomento de Pesca y Caza, Valparaiso, Chile.

"El Langostino Chileno" (The Chilean Langostino), by Elda Fagetti G., article, Boletín Informativo del Departamento de Fomento de Pesca y Caza, no. 69, May 1959, pp. 10-12, processed in Spanish. Ministerio de Agricultura, Direccion General de Produccion Agraria y Pesquera, Departamento de Fomento de Pesca y Caza, Valparaiso, Chile.

Reglamento del Decreto con Fuerza de Ley No. 34 de 12 de Marzo de 1931 sobre Pesca; Decreto

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No. 1584 de 30 de Abril de 1934 (Rules and Regulations of the Decree with Force of Law No. 34 of March 12, 1931 on Fishing; Decree No. 1584 of April 30, 1934), 27 pp., processed in Spanish. Ministerio de Agricultura, Direccion General de Produccion Agraria y Pesquera, Departamento de Fomento de Pesca y Caza, Valparaiso, Chile.

"Trabajos Realizados por la Comision Nacional de la Merluza" (Accomplishments of the National Hake Commission), by Fernando de Buen, article, Boletin Informativo del Departamento de Pesca y Caza, no. 67, March 1959, pp. 7-15, processed in Spanish. Ministerio de Agricultura, Direccion General de Produccion Agraria y Pesquera, Departamento de Fomento de Pesca y Caza, Valparaiso, Chile.

Vedas y Otras Disposiciones Referentes a Pesca y Caza (Seasons and Other Requirements Pertaining to Fishing and Hunting), 15 pp., illus., printed in Spanish. Ministerio de Agricultura, Direccion General de Produccion Agraria y Pesquera, Valparaiso, Chile. Instructions for officials responsible for enforcing the laws and regulations of fishing and hunting.

#### COD:

"Noruega y las Grandes Pesquerias de Bacalao" (Norway and the Great Cod Fisheries), article, Boletin Informativo del Departamento de Fomento de Pesca y Caza (Information Bulletin of the Department of Fish and Game Development), no. 69, May 1959, pp. 4-7, processed in Spanish. Ministerio de Agricultura, Direccion General de Produccion Agraria y Pesquera, Departamento de Fomento de Pesca y Caza, Valparaiso, Chile.

Recent Studies of Decomposition in Frozen Raw Cod (Lecture delivered at the Annual Meeting of the Inspection and Consumer Service, Department of Fisheries, Ottawa, Canada, November 3-7, 1958), by L. M. Beacham. Department of Fisheries, Ottawa, Canada.

#### COOKERY:

Canadian Fish Cook Book, 97 pp., illus., printed, C\$1. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1959. A handbook published by the Ministry of Fisheries on how to buy, prepare, and serve all kinds of Canadian fish and shellfish at every season of the year. Includes instructions on storing fish in the home and preparing it for cooking. Also contains a variety of recipes for baking fish both whole and in fillets and steaks, oven steaming, broiling, panfrying, deep fat frying, cooking in water, and cooking in milk. Presents instructions for preparing shellfish, dried, smoked, and pickled fish, appetizers and cocktails, soups and chowders, sauces, casseroles, luncheon and supper dishes, salads, sandwiches and snacks, and for canning and freezing fish. Attractively illustrated with many photographs, several of which are in full color.

#### CRAB MEAT:

Processing Methods for the Preparation of Chilled Crabmeat from the Atlantic Coast Blue

Crab, by D. H. B. Ulmer, Jr. and others, 25 pp., processed. University of Maryland, Seafood Processing Laboratory, Crisfield, Md., April 1959.

"Studies on the 'Browning' of Canned Crab Meat (Paralithodes camtschatica Til.). I--The Difference in the Chemical Composition of Normal and Browning Canned Crab Meat," by Yoshio Nagasawa, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, nos. 6 and 7, 1958, pp. 535-540, printed. Japanese Society of Scientific Fisheries, c/o Tokyo Suisan Daigaku, Shiba-kaigandori 6-Chome, Tokyo, Japan.

#### CRABS:

The Abundance of Crabs in Chesapeake Bay, by David G. Cargo and L. Eugene Cronin, Ref. No. 59-41, 8 pp., illus., processed. Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md., September 1959.

#### CRAWFISH:

"An Illustrated Key to the Crawfishes of Louisiana with a Summary of Their Distribution Within the State," by George Henry Penn, article, Tulane Studies in Zoology, vol. 7, no. 1, April 23, 1959, pp. 3-20, illus., printed. Meade Natural History Library, Tulane University, New Orleans, La.

#### DELAWARE RIVER:

A Brief Report on the Study of Governmental Organization for the Water Resources of the Delaware River Basin by the Maxwell Graduate School, Syracuse University, 30 pp., illus., printed. Water Research Foundation, Maxwell Graduate School, Syracuse University, Syracuse, N. Y., 1959.

#### FATTY ACIDS:

"Chemical and Kinetic Studies on the Autoxidation of Fatty Acid Esters," by O. S. Privett, article, Annual Report of the Hormel Institute 1956-57, pp. 7-12, printed. The Hormel Institute, Austin, Minn., 1957.

"Investigation of Chemical Reactions of Fish Oil Fatty Acids," by Hermann Schlenk, article, Annual Report of the Hormel Institute 1956-57, pp. 54-57, printed. The Hormel Institute, Austin, Minn., 1957.

"A Rapid Method for the Study of the Effect of Unsaturated Fatty Acids on Cholesterol Metabolism in Rats," by Jens G. Hauge and Ragnar Nicolaysen, article, Acta Physiologica Scandinavica, vol. 45, 1959, pp. 19-25, printed in Swedish. Department of Physiology, Karolinska Institute, Stockholm, Sweden.

#### FISH JELLY:

"Studies on the Internal Spoilage of Fish-Jelly Products. III--Measurement of Oxidation-Reduction Potential in Fish-Jelly Products," by Motonobu Yokoseki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 9, 1959, pp. 765-769, illus., printed in Japanese with English abstract. Japanese

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Society of Scientific Fisheries, c/o Tokyo Suisan Daigaku, Shiba-kaigandori 6-Chome, Tokyo, Japan.

#### FISH MEAL:

Fish Meal, by Geo. E. Tunnicliffe and Matthew Weatherstone, German Patent No. 952,680, November 22, 1956. Patent Office, German Federal Republic, Bonn, Germany.

"Fluctuations in Moisture Content of Fish Meal," by G. H. Stander, article, Annual Report, Fishing Industry Research Institute, April-December 1956, vol. 10, p. 23, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa, 1957.

Treating Protein Meal of Marine Origin, by Anton J. S. Marstrand, British Patent No. 810,689, March 18, 1959. British Patent Office, London, England.

#### FISH OIL:

"A Study of the Odor Problem in Fish Oils," by J. R. Chipault, article, Annual Report of the Hormel Institute 1956-57, pp. 50-54, printed. The Hormel Institute, Austin, Minn., 1957.

The Use of Fish Oils for Fatliquoring Leather. III--Suitability of Ocean Perch, Herring, Salmon, and Menhaden Oils in Fatliquoring, by Victor Mattei and William T. Roddy, 14 pp., illus., printed. (Reprinted from The Journal of the American Leather Chemists Association, vol. LIV, No. 11, November 1959, pp. 640-653.) Tanners' Council Research Laboratory, University of Cincinnati, Cincinnati, Ohio. In this study, fatliquoring with ocean perch, herring, salmon, and menhaden oils produced leathers with about the same amount of extractable grease and the same firmness as did fatliquoring with cod oil. There was some evidence that the surface of leather fatliquored with the oil of cod was softer than that fatliquored with the oils from other fish.

#### FLOATING TRAWL:

"Model Tests of 6 x 6 Fathoms Floating Trawl," article, Fiskaren, vol. 35, no. 32, August 6, 1958, p. 3, printed in Norwegian. Fiskaren, Stradkaien 6, Bergen, Norway.

#### FLORIDA:

Summary of Florida Commercial Marine Landings and an Analysis of the Catch and Effort of Certain Species, 1958, by Albert Rosen, no. 59-4, 56 pp., illus., processed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla., October 1959. Presents a summary of Florida's commercial landings of marine products and effort data for 1958. The fisheries for shrimp, mullet, Spanish mackerel, red snapper, menhaden, and other species are covered. Discusses the mechanics of the fish ticket program, which was devised to improve the accuracy and detail of data collected, to measure the relative changes in fishing intensity by type of gear, and to measure the catch per unit of effort by different gear types. Includes

a number of statistical tables giving data on landings and value of catches by species during 1958.

#### FOOD AND AGRICULTURE ORGANIZATION:

Current Bibliography for Aquatic Sciences and Fisheries, vol. 2, no. 7, July 1959, 174 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Current Bibliography for Aquatic Sciences and Fisheries, vol. 2, no. 8, August 1959, 166 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Current Bibliography for Aquatic Sciences and Fisheries, vol. 2, no. 9, November 1959, 233 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

PENEIDAE et PANDALIDAE Presentant un Interet Economique en Adriatique (Peneidae and Pandalidae of Economic Importance in the Adriatic), by Otmar Karlovac, General Fisheries Council for the Mediterranean, Working Paper No. 40, Fifth Meeting, October 13-18, 1958, 4 pp., processed. GFCM Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy. During experimental trawling in deep waters of the South Adriatic various species of adult crustaceans, up to now unknown in this region, were identified.

Situation of the Fishing Industry in Italy, Particularly Regarding Distribution, by Paolo Pagnazzi, GFCM Studies and Reviews No. 8, 24 pp., processed. General Fisheries Council for the Mediterranean Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, October 1959. Presented as technical paper no. 60 at the Fifth Meeting of the General Fisheries Council for the Mediterranean, Rome, October 13-18, 1958. Covers the mechanization of the Italian fishing fleet, quantity and value of fishery products landed between 1951 and 1957, imports of fishery products, and national per capita consumption of fish. Towards increased production and consumption of fishery products in Italy, the author recommends "activities designed to: increase the commercial potential of the producers, who will sooner or later be grouped into an association, having as its aim a better legal code and better equipped fish-sale points; obtain a better transport system in order to ensure a wider distribution of fishery products throughout the country; lead to a better distribution of demand in time, a demand which today is concentrated on certain days for reasons quite other than the consumer's choice."

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These reports have not been published on a sale basis, but have been processed

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only for limited distribution to governments, libraries, and universities. Food and Agriculture Organizations of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Report to the Government of Pakistan on a New Fish Harbour for Karachi, by A. van den Berg and H. van Pel, FAO Report No. 26, Part One - text, Part Two - plans, 60 pp. and 15 charts, processed, March 1952.

Informe al Gobierno de Colombia sobre el Fomento de la Industria Pesquera (Report to the Government of Colombia on the Development of the Fishing Industry), by Valentin Paz-Andrade, FAO Report No. 509, 15 pp., processed in Spanish, June 1956.

Informe al Gobierno de Chile sobre Manipulación, Elaboración y Distribución de Pescado (Report to the Government of Chile on Handling, Processing, and Distribution of Fish), by Niels P. Hansen, FAO Report No. 535, 39 pp., illus., processed in Spanish, January 1957.

Report to the Government of Turkey on Fishery Biology, by Olav Aasen, FAO Report No. 540, 40 pp., illus., processed, November 1956.

Informe al Gobierno de Chile sobre Biología Pesquera (Report to the Government of Chile on Fishery Biology), by Fernando de Buen Lozano, FAO Report No. 573, 54 pp., illus., processed in Spanish, 1957.

Report to the Government of Turkey on Fishing Boats, by Howard I. Chapelle, FAO Report No. 706, 106 pp. and 45 charts, processed, 1957.

Informe al Gobierno del Ecuador sobre el Proyecto y Construcción de la Estación Experimental para la Elaboración de Pescado de Manta y sobre los Metodos de Elaboración de Pescado (Report to the Government of Ecuador on the Planning and Construction of the Experimental Station for Processing Manta's Fish and on the Methods of Processing Fish), by K. Hoydal, FAO Report No. 720, 65 pp., illus., processed in Spanish, 1958.

Rapport au Gouvernement du Liban sur la Pêche (Report to the Government of Lebanon on Fisheries), by Jean Gaudilliere, FAO Report No. 780, 151 pp., processed in French, 1958.

Report to the Government of Brazil on Fishery Biology, by Finn Devold, FAO Report No. 798, 68 pp., illus., processed, 1958.

Report to the Government of India on the Organization and Operation of Training Centres for Fishermen, by P. A. Lusyne, FAO Report No. 806, 44 pp., illus., processed, 1958.

Informe al Gobierno de México sobre Consumo y Distribución del Pescado en los Mercados (Report to the Government of Mexico on the Consumption and Distribution of Fish in the Markets), by John Fridthjof, FAO Report No. 843, 23 pp., illus., processed in Spanish, 1958.

Rapport au Gouvernement de la Tunisie sur la Situation de la Flotte Chalutiere Tunisienne (Report to the Government of Tunisia on the Situation of the Tunisian Trawler Fleet), by Peter Gurtner, FAO Report No. 864, 45 pp., illus., processed in French, 1958.

Report to the Government of Saudi Arabia on Exploration and Commercial Fishing Operations in the Red Sea, by Gonzalo G. Ferrer, FAO Report No. 877, 26 pp., illus., processed, 1958.

Rapport au Gouvernement du Maroc sur les Pêches dans les Eaux Intérieures (Report to the Government of Morocco on the Inland Waters Fisheries), by Wm. A. Dill and M. J. Girard, FAO Report No. 888, 15 pp., processed in French, 1958.

Informe al Gobierno de Paraguay sobre los Recursos Pesqueros de sus Aguas Continentales (Report to the Government of Paraguay on Fishery Resources in its Territorial Waters), by C. J. D. Brown, FAO Report No. 900, 54 pp., illus., processed in Spanish, 1959.

Informe al Gobierno de Chile sobre la Pesca con Embarcaciones Menores (Report to the Government of Chile on the Fishery with Smaller Vessels), by Charles Olesen, FAO Report No. 907, 57 pp., illus., processed in Spanish, 1958.

Informe Sumario al Gobierno de la Republica Argentina sobre la Industria de la Pesca Marítima en Argentina (Summary Report to the Government of the Republic of Argentina on the Marine Fisheries Industry in Argentina), by Jorge d'Alarcao, FAO Report No. 912, 129 pp., illus., processed in Spanish, 1958.

Report to the Government of India on Fish Marketing in Bombay, Madras, and Mysore States, by F. H. Barling, FAO Report No. 931, 106 pp., processed, 1958.

Report No. 1 to the Government of India on Fishing Boats, by Paul B. Ziener and Kjeld Rasmussen, FAO Report No. 945, 138 pp., plus many drawings and photos, processed, 1958.

Report to the Government of Pakistan on Fish Marketing in West Pakistan, by C. Eriksen, FAO Report No. 980, 15 pp., illus., processed, 1958.

Rapport au Gouvernement du Liban sur le Développement des Pêches dans les Eaux Intérieures (Report to the Government of Lebanon on the Development of its Inland Waters Fisheries), by M. J. A. Timmermans, FAO Report No. 984, 33 pp., illus., processed in French, 1959.

Report to the Government of Kenya on the Sea Fisheries of Kenya, by J. A. Crutchfield, FAO Report No. 990, 26 pp., processed, 1958.

Report to the Government of Pakistan on Hilsa Fishery and Fish Passes, by G. B. Talbot, FAO Report 1008, 17 pp., illus., processed, 1959.

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#### FOOD PRESERVATIVES:

"Food Preservatives: Toxicological Considerations," by J. M. Barnes, article, Chemistry and Industry, no. 18, May 2, 1959, pp. 557-559, printed. Chemistry and Industry, 14 Belgrave Square, London W. 1, England. This paper considers the toxicology of benzoic acid, sulphur dioxide, nitrites, sodium diacetate, propionates, and sorbic acid as preservatives for human food.

#### FRANCE:

"L'Exploitation des Eaux du Bassin de Thau" (Exploitation of the Waters of Lake Thau), by F. Doumenge, article, Revue de l'Economie Meridionale, vol. VII, no. 27, July-September 1959, pp. 243-266, illus., printed in French. Centre Regional de la Productivite et des Etudes Economiques, Faculte de Droit, Montpellier, France. Lake Thau, on the Mediterranean Coast of France, has a permanent link with the sea. Thus, its fisheries and effect on fisheries in the sea, are quite important.

France Peche, vol. 4, no. 34, Special Number, November 1959, 136 pp., illus., printed in French. France Peche, Tour Sud-Est, Rue de Guemene, Lorient, France. Includes articles on: "1959 Panorama of World Fishing;" "Exports of Japanese Tunny-Fish to the U. S. A. Create Difficulties," by Jules Molard; "The World Scientific Congress on the Biology of the Sardine and Allied Species," by Robert Lenier; "Fishing in Israel," by R. Rupp; "Japanese Tunny-Fishing Methods," by Robert Lenier; "Organization of an Insurance Scheme for Coastal Fishermen in Canada," by L. S. McArthur; "Nomenclature and Technology of Equipment for the Fishing Industry" (comprehensive coverage of various aspects of vessels and gear); "Technical Fish Index;" and "The Locating of Fish with Echo-Sounders."

#### FREEZE-DRYING:

"Freeze-Drying Looks Up," by Paul W. Patton, article, Food Engineering, vol. 31, June 1959, pp. 78-80, printed. Food Engineering, McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 18, N. Y.

#### FREEZING:

"The Freezing of Fish in Railway Freezers," by A. Piskarev and A. Kaminarskaya, article, Kholodil'naiia Tekhnika, No. 5, 1959, pp. 30-33, illus., printed in Russian with English summary. Kholodil'naiia Tekhnika, c/o Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

#### FRESH-WATER FISH:

"Composition of Certain Species of Fresh-Water Fish. II--Comparative Data for 21 Species of Lake and River Fish," by Claude E. Thurston and others, article, Food Research, vol. 24, no. 5, September-October 1959, pp. 493-502, printed. Food Research, The Garrard Press, 510 North Hickory St., Champaign, Ill.

#### GENERAL:

On the Availability of Food to Fish in Marine Waters, by L. A. Zenkevich (M. V. Lomonosov University, Moscow), 18 pp., processed. (Trans-

lated from Trudy Vsesoiuznoi Konferentsii po Voprosam Rybnogo Khoziaistva, 1951, pp. 529-537.) U. S. Department of State, Washington 25, D. C.

Where Does the Shoreline Begin? by Frederick A. Kalber, Jr., 3 pp., illus., printed. (Reprinted from Delaware Conservationist, Summer 1959, pp. 4-6.) Board of Game and Fish Commissioners, Dover, Del.

#### GERMAN FEDERAL REPUBLIC:

Jahresbericht uber die Deutsche Fischwirtschaft, 1958 (Yearbook of the German Fisheries, 1958), 307 pp., illus., printed in German with summaries in English, DM 25 (about US\$5.98). Verlag Gebr. Mann, Berlin, Germany, October 1959. A review covering all phases of the German fisheries in 1958. Each chapter is followed by a summary in English and all statistical tabulations have English subcaptions. Issued by the Ministry of Food, Agriculture, and Forestry which includes the Fisheries Directorate. Part I contains information on fishery policy in 1958, the United Nations Conference on the Law of the Sea, landings, the fishing fleet, and consumption of fishery products. Part II includes information on cruises of the fishery protection vessels and fishery research vessel, the vocational seamen's association, the work of the German Scientific Commission for the Exploration of the Sea, and fishery research. Part III presents data on the German deep-sea fishery in 1958, the lugger herring fishery, cutter deep-sea and coastal fisheries, fresh-water fisheries, the fish processing industry, publicity campaign for seafood in 1958/59, promotion of fish marketing, and elasticities in the demand for fishery products. Part IV, included in the yearbook for the first time, gives data on foreign fisheries and whaling.

#### HADDOCK:

The Planktonic Stages of the Haddock in Scottish Waters, by Alan Saville, Scottish Home Department, Marine Research No. 3, 23 pp., illus., printed, 7s. 6d. (about US\$1.05). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1959.

#### INTERNATIONAL COMMISSIONS:

International Fisheries Convention of 1946, The Permanent Commission Report by the President on the Seventh Meeting (held in Dublin, November 1958), 35 pp., processed in French and English. Office of the Permanent Commission, Rm. 419, 3 Whitehall Place, London, S. W. 1, England, 1959. Proceedings of the Seventh Meeting of the Permanent Commission held at Dublin from November 25 through 28, 1958. Includes, among other topics, discussion of application of the present mesh provisions; reports from the liaison committee of the International Council for the Exploration of the Sea; proposal to increase the mesh size in trawl nets in the northeastern part of the Convention area; amendment of Article 7(2) of the Convention (use of cod-end covers); report by the Infractions Committee; request for contribution by the Permanent Commission to the funds of the International



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al Council for the Exploration of the Sea; and relations with other international organizations.

(International North Pacific Fisheries Commission) Annual Report for the Year 1958, 123 pp., illus., printed. International North Pacific Fisheries Commission, 6640 N. W. Marine Drive, Vancouver 8, B. C., Canada, 1959. This is the fifth consecutive annual report issued by the Commission since it was established by Convention between Canada, Japan, and the United States on June 12, 1953. It consists of three parts: a report of accomplishments of the Commission's annual meeting, held in Tokyo from November 4 through 10, 1958; a summary of administrative activities during the previous year; and progress reports on research conducted by the member governments under the Commission's program. For the first five years of operation of the Commission, abstention from fishing by certain contracting parties on the salmon, halibut, and herring stocks of the eastern North Pacific was operative without necessity of an annual determination as to continued qualification of the stocks originally specified. At the 1958 Annual Meeting, however, the Commission undertook a review of the qualification of stocks in question for continued abstention. No recommendation for a change in the stocks under abstention was made. Progress in research on the salmon questions raised by the Protocol has been outstanding. Knowledge of the distribution and intermingling of the several salmon species from the two continents is increasing steadily, although quantitative data on intermingling is meager. The great extent of the area of intermingling and the many complexities of intermingling by species and by time make the problem of confirming or changing the provisional line, in order to divide more equitably the salmon stocks from Asia and North America, a difficult one. Studies of the stock of king crab of the eastern Bering Sea were continued by Japanese and United States scientists. Research has not yet progressed sufficiently, however, to indicate whether or not joint conservation measures are required.

#### IRRADIATION PRESERVATION:

Proceedings of the International Conference on the Preservation of Foods by Ionizing Radiations, July 27-30, 1959, 294 pp., illus., processed. Department of Food Technology, Massachusetts Institute of Technology, Cambridge 39, Mass. Includes the Conference program, panel participants, foreign delegates, and list of observers, as well as the speeches and papers read during the Conference. While none of the papers deals directly with irradiation of fishery products, all are of vital interest to fishery technologists as well as industry members. Probably most pertinent are those papers on: "General Considerations Relating to Food Irradiation," by Bernard E. Proctor; "Direct and Indirect Effects of Radiations," by Samuel A. Goldblith; "A Program for the Evaluation of the Possible Toxicity of Irradiated Foods," by Irvin C. Plough; and "The Effects of Ionizing Radiations on the Nutritive Value of Foods," by Merrill S. Read.

#### ISRAEL:

Fishermen's Bulletin, vol. 3, no. 1 (21), September 1959, 28 pp., illus., printed in Hebrew with English abstracts. Fishermen's Bulletin, P. O. Box 699, Haifa, Israel. Includes, among others, these articles: "Trawl Boat Expenses in Foreign Currency," by M. Kramer and S. Lipstadt; "Savings Gear Experiments with Trawl Nets (1958-59)," by E. Gottlieb; and "Trawler and Trawl in Action, III," by M. Ben-Yami.

#### JAPAN:

Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, no. 4, August 1959, 92 pp., illus., printed in Japanese with English summaries. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Minato-ku, Tokyo, Japan. Contains, among others, these articles: "Fishing Conditions for Squid off the Oki Islands. III--Effect of the Surface Current on Formation of Fishing Grounds," by Shumpei Kojima; "On the Spawning of the Ayu, *Plecoglossus altivelis* T. & S. I--Structure of the Spawning Shoal and Spawning Behaviour," by Rikizo Ishida; "Studies on the Discoloration in Fish Meat During Freezing Storage. II--A Spectrophotometric Method for the Simultaneous Determination of Ferrous and Ferric Forms of Myoglobin in Tuna Meat," by Yoshihiko Sano, Kanehisa Hashimoto, and Fumio Matsuura; "Effectiveness of Dip in Iced Chlortetracycline (CTC)-Containing Sea Water on Keeping Quality of Mackerel A-board Ship and Determination of CTC Residue on the Fish," by Tetuo Tomiyama and Yasuo Yone; "Gas Content of the Blood in Response to that of Medium Water in Fish. II--Comparison of the Responses in Several Species," by Yasuo Itazawa; and "Change of Free Amino Acids During the Manufacturing Process of 'Katsuwobushi' (Dried Bonito)," by Shoji Konosu and Yoshiro Hashimoto.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, no. 5, September 1959, 83 pp., illus., printed in Japanese with English summaries. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Minato-ku, Tokyo, Japan. Includes, among others, articles on: "Studies on the Estimate of the Distribution Density of Salmon Population on the High Seas," by Kisaburo Taguchi; "The Measurements of Tension on the Salmon Drift Net. I," by Yasuji Kondo and Makoto Suzuki; "Studies on the Method for Testing the Spoilage of Food. X--Errors Involved in Ota's Method for Determination of Histamine," by Atsushi Tsuda, Kenji Mori, and Tetuo Tomiyama; "On the Browning of Dried Fish Products," by Chiaki Koizumi, Soichi Kurobe, and Junsaku Nonaka; "Studies on the Influence of Treatments Immediately After Catching upon the Quality of Fish Flesh. I--Examinations on Killing and Storing Methods for Keeping Quality of Mackerel, Dace, and Carp," by Yasuhiko Tsuchiya and others; "Studies on the Influence of Treatments Immediately After Catching Upon the Quality of Fish Flesh. II--Further Examinations of Treatments on Keeping Quality of Fish," by Yasuhiko Tsuchiya and others; "Studies on the Influence of Treatments Immediately After Catch-

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ing upon the Quality of Fish Flesh. III--Effect of Several Treatments on Keeping Quality of Bass Meat," by Yasuhiko Tsuchiya and others; and "Studies on the Proteinase of Pyloric Caeca. II--Preparation of Crystalline Proteinase of Tunny Pyloric Caeca by Ion Exchange Resin," by Yoshihisa Togasawa and Teizo Katsumata.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, no. 6, October 1959, 98 pp., illus., printed in Japanese with English summaries. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kai-gandori 6-chome, Minato-ku, Tokyo, Japan. Includes, among others, these articles: "Studies on the Kinematic Behaviour of the Ground Rope of the Trawl Net. I," by Tasae Kawakami and Otohiko Suzuki; "Annual and Monthly Variation of Fishing Condition and Distribution of Yellowfin Tuna in the Arabian Sea," by Jun Nakagome; "Annual and Monthly Variation of Fishing Condition and Distribution of Black Marlin in the Arabian Sea," by Jun Nakagome; "Studies on Movements of Albacore Fishing Grounds in the North West Pacific Ocean. II--Influence of Fluctuations of the Oceanographical Conditions upon the Migration and Distribution (Pattern) of Albacore in the Winter-Summer Period and Its Fishing Grounds in Southern Waters Off Japan," by Motoo Inoue; "Enhancing Effect of Starch on Jelly Strength of Fish Meat Jelly. III--Model Experiments with Synthetic Resin Particles," by Minoru Okada and Atsuko Yamazaki; "Enhancing Effect of Starch on Jelly Strength of Fish Meat Jelly. IV--Relation between Properties of Starch and Reinforcing Ability," by Minoru Okada and Atsuko Yamazaki; "Enhancing Effect of Starch on Jelly Strength of Fish Meat Jelly. V--Application of Modified Starch to Kamaboko Manufacture," by Minoru Okada and Atsuko Yamazaki; "Studies on the Method for Testing the Spoilage of Food. XI--A New Method for Determination of Histamine in Tissues," by Atsushi Tsuda and Tetuo Tomiyama; "Comparative Studies on Two Hemoglobins of Salmon. II--Crystallization and Some Physical Properties," by Kanehisa Hashimoto and Fumio Matsura; "Studies on the Proteinase of Pyloric Caeca. III--Preparation of Crystalline Proteinase of Bonito Pyloric Caeca," by Yoshihisa Togasawa, Teizo Katsumata and Masashi Ishikawa; "Studies on the Food Poisoning Associated with Putrefaction of Marine Products. VIII--Distribution of 1-(-)-Histidine Decarboxylase among Proteus Organisms and the Specificity of Decarboxylating Activity with Washed Cell Suspension of *Proteus morganii* with Special Reference to the pH," by Toshiharu Kawabata and Shigeru Suzuki; and "Studies on the Food Poisoning Associated with Putrefaction of Marine Products. IX--Factors Affecting the Formation of 1-(-)-Histidine Decarboxylase by *Proteus morganii*," by Toshiharu Kawabata and Shigeru Suzuki.

#### LAKE TANGANYIKA:

Note sur la Peche au Ndagala au Lac Tanganika (Note on the Ndagala Fishery of Lake Tanganyika), by A. Collart, 16 pp., illus., printed in French. (Reprinted from Bulletin Agricole du

Congo Belge, vol. 47, no. 4, 1956.) Direction de l'Agriculture des Forets et de l'Elevage, 7, Place Royale, Brussels, Belgium, 1956.

Peche Artisanale et Peche Industrielle au Lac Tanganika (Traditional Fishery and Industrial Fishery of Lake Tanganyika), by A. Collart, 100 pp., illus., printed in French. Direction de l'Agriculture des Forets et de l'Elevage, 7, Place Royale, Brussels, Belgium, 1958.

#### LEGISLATION:

State Boat Act, 11 pp., printed. (Reprinted from Suggested State Legislation--Program for 1959, pp. 53-63.) The Council of State Governments, 1313 East 60th St., Chicago 37, Ill. Describes a model code developed by the Committee on Suggested State Legislation of the Council of State Governments. This code is designed to complement Public Law 85-911, which provides that after April 1, 1960, all motorboats not having marine documents from the U. S. Bureau of Customs must be numbered for purposes of identification.

#### MACKEREL:

"O Priniatii Mer po Prekrashcheniiu Vylova Molodi Stavridy, *Trachurus*" (On Measures of Ending the Catching of Young Mackerel), by Iu. P. Zaitsev, article, Rybnoe Khoziaistvo, no. 4, April 1958, pp. 12-13, printed in Russian. Rybnoe Khoziaistvo, Four Continent Book Corporation, 822 Broadway, New York 3, N. Y.

"Sezonnye Izmeneniia V Promysle Stavridy, *Trachurus*, V Chernom More" (Seasonal Changes in the Mackerel Fishery in the Black Sea), by T. G. Liubimova, article, Rybnoe Khoziaistvo, no. 5, May 1958, pp. 13-15, printed in Russian. Rybnoe Khoziaistvo, Four Continent Book Corporation, 822 Broadway, New York 3, N. Y. The large mackerel fishery in the Black Sea was organized in 1953. During the past five years there have been explorations, surveys, and checks on the distribution, feeding, and nursery grounds, migration, and catching techniques. Analysis showed that between 1954-1957 hauls have diminished to half. The entire life cycle of large mackerel proceeds within the boundary of the Black Sea. In spring, mackerel migrate to northern Caucasus and to the Crimea sections for spawning. During their advance toward the northwestern part of the Sea, mackerel feed intensively, often stopping for a long time to devour large groups of anchovy. While spawning, in June-July, mackerel keep in small groups, and landings are light. After spawning, mackerel go to the shore area in the southeastern part of the Sea. Here mackerel are caught in drop nets. For the winter, the fish migrate to Anatolii Beach. Records show that Black Sea mackerel have been found to be from 2-13 years of age and in sizes of 25-44 cm. Between 1949-1957, small mackerel completely disappeared. Older and larger fish, from six years and over, predominate, and in the past few years their sizes have been from 30-48 cm. This accounts for the shift and maximum catches during the spring and summer months. Since older groups of mackerel remain on the

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feeding grounds for a shorter period and migrate earlier for the winter, the fall fishery in the Caucasus has diminished. Efforts are being directed now to concentrate the catching and utilization of mackerel during their spring migration.

#### MARKETING:

Sales Contests for Wholesalers, by Henry D. Ostberg, Small Marketers Aids No. 47, August 1959, 4 pp., illus., printed. Small Business Administration, Washington 25, D. C. Practical suggestions for sales contests are presented. A well-planned contest can boost the salesmen's morale as well as increase the firm's sales. The five steps, outlined in this leaflet, that are involved in setting up a successful contest are: (1) establishing the purpose, (2) deciding on a scoring method, (3) selecting a theme and prizes, (4) promoting, and (5) awarding the prizes.

#### NUTRITION:

"Nutritional Values and Vitamins of Norwegian Fish and Fish Products," by Torleiv Taarland and others, article, Tidsskrift for Hermetikindustri, vol. 44, 1958, pp. 405-412. Tidsskrift for Hermetikindustri, Stavanger, Norway.

#### OCEANOGRAPHY:

Annual Report of the Oceanographic Institute, Fiscal Year 1958-1959, 20 pp., processed. The Oceanographic Institute, Florida State University, Tallahassee, Fla., November 1959. Describes the functions and activities of the Oceanographic Institute during the fiscal year July 1, 1958 to June 30, 1959. Emphasis is placed on research projects completed or currently under way.

#### PARASITES:

Parasites of the Commercial Shrimps, PENAEUS AZTECUS Ives, P. DUORARUM Burkenroad, and P. SETIFERUS (Linnaeus), by Dwayne Nathaniel Kruse, 22 pp., illus., printed. (Reprinted from Tulane Studies in Zoology, vol. 7, no. 4, October 19, 1959, pp. 123-144.) Florida State University, Oceanographic Institute, Tallahassee, Fla.

#### PERU:

La Pesca en el Peru en 1958 (Peru's Fishery in 1958), by Javier Iparraguirre Cortez, Serie de Divulgacion Cientifica No. 12, 14 pp., processed in Spanish. Dirreccion de Pesqueria y Caza, Ministerio de Agricultura, Lima, Peru. A statistical report on Peru's fishery in 1958, including data on fish freezing, fish canning, fish meal and oil, production of fish and shellfish by species and ports, volume and value of fishery products consumed in the city of Lima, national consumption of domestic and imported fish, supplies of fish in the city of Lima, utilization of fish landed, imports of fishery products, exports by type of product and country of destination, and landings of whales.

#### PORPOISES:

Auditory Perception of Submerged Objects by Porpoises, by W. N. Kellogg, 6 pp., illus., printed. (Reprinted from The Journal of the Acoustical Society of America, vol. 31, no. 1,

January 1959, pp. 1-6.) Florida State University, Oceanographic Institute, Tallahassee, Fla.

Echo Ranging in the Porpoise, by W. N. Kellogg, 7 pp., illus., printed. (Reprinted from Science, vol. 128, no. 3330, October 24, 1958, pp. 982-988.) Florida State University, Oceanographic Institute, Tallahassee, Fla. Perception of objects by reflected sound is demonstrated for the first time in marine animals.

#### QUALITY:

"Improvement in Quality of Iced White Fish--Boxing at Sea and Stowage in Chilled Sea Water," article, Food Investigation 1957, Report of the Food Investigation Board (Great Britain), pp. 6-7, printed. Department of Scientific and Industrial Research, Charles House, 5-11 Regent St., London S. W. 1, England, 1958.

#### SANITATION:

The Care of the Trawler's Fish, by C. L. Cutting, G. C. Reay, and J. M. Shewan, D. S. I. R. Food Investigation Leaflet No. 3, 14 pp., printed, 9d. (about 10 U. S. cents). Her Majesty's Stationery Office, York House, Kingsway, London W. C. 2, England, 1953.

#### SEA LIONS:

"Sea Lion Hunt," by Vincent Sollecito, Alaska Sportsman, vol. 26, no. 1, January 1960, pp. 8-11, 42-46, illus., printed. Alaska Sportsman, Alaska-Northwest Publishing Co., Juneau, Alaska. Recounts the trip of the vessel "Arctic Maid" to the islands of southwestern Alaska, in the Kodiak area, to hunt for predatory sea lions. The voyage was financed by the U. S. Fish and Wildlife Service, which supplied three biologists to study these mammals which are considered a menace to the salmon and halibut fisheries. The objectives of the hunt were to determine whether the sea lion population could be cut down, and to find out if the kill would be commercially profitable.

#### SEA ROBIN:

"The Sea Robin," by Alfred Perlmutter, article, The New York State Conservationist, vol. 14, no. 3, December-January 1959-60, pp. 12-13, illus., printed. New York State Conservation Dept., Arcade Bldg., Albany, N. Y. Describes the sea robin--a neglected food and sport fish. Although the sea robin is covered with bony plates and has sharp spines on the fins, the meat is tender and succulent and has long been prized by some Europeans. A series of photos shows the sea robin "from fantasy to frying pan in six easy steps."

#### SEA TROUT:

A Contribution to the Biology of the Spotted Weakfish, CYNOSCIÓN NEBULOSUS, (Cuvier), from Northwest Florida, with a Description of the Fishery, by Edward F. Kilma and Durbin C. Tabb, Technical Series No. 30, 23 pp., illus., printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla. Describes the material and methods used in a study of the spotted sea trout (weakfish), the commercial fishery and landings, the sport fishery, gear selectiv-

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ity, age and growth, spawning, size and age at first maturity, food, and ecology.

#### SNOOK:

Aspects of the Biology of the Common Snook, CENTROPOMUS UNDECIMALIS (Bloch) of South-west Florida, by Alfred V. Volpe, Technical Series No. 31, 35 pp., illus., printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla., June 1959.

#### SPAIN:

"Ante la I Asamblea de Cofradías de Pescadores" (Preparations for the First General Assembly of Fishermen's Trade Unions), article, Boletín de Informacion del Sindicato Nacional de la Pesca, no. 13, October 1959, pp. 6-29, illus., printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6a Planta, Madrid, Spain. Presents a summary of preparations for the First Assembly of Spain's Fishermen's Trade Unions, held in Madrid November 24-28, 1959. Explains the establishment of various committees and thereby describes much of the structure of the Spanish fishing industry.

#### SPANISH MACKEREL:

Aspects of the Biology and the Fishery for Spanish Mackerel, SCOMBEROMORUS MACULATUS (Mitchell), of Southern Florida, by Edward F. Klima, Technical Series No. 27, 37 pp., illus., printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla., June 1959. Describes the methods and material used in a study of the Spanish mackerel fishery of Florida, its taxonomy, commercial and sport phases, and gear selectivity. A section on biology discusses an analysis of stomach contents, spawning, size at maturity, and age and growth of the Spanish mackerel.

#### SPOILAGE:

A Note to the Fishing Skippers Regarding the Factors that Hasten Deterioration of Fish in the Boats at Sea, Circular New Series No. 1, 6 pp., printed. Fisheries Research Board of Canada, Fisheries Experimental Station, Halifax, Nova Scotia, Canada, June 1953.

Spoilage Problems in Fresh Fish Production, by C. H. Castell, Bulletin No. 100, 25 pp., printed. Fisheries Research Board of Canada, Ottawa, Canada.

#### SURINAM:

L. V. V. in 1957 (1957 Annual Report of Department of Agriculture, Animal Husbandry, and

Fisheries), 216 pp., illus., printed in Dutch. Department of Agriculture, Animal Husbandry, and Fisheries, Paramaribo, Surinam. The section of this report covering fisheries includes information on management and organization; production, import, and export of fish and fish products; research; development of the fishery and related information.

#### TRANSPORTATION:

"The Road Transport of Sea Products," by M. Duclos, article, Revue Generale du Froid, vol. 35, no. 9, September 1958, pp. 863-865, printed in French. Association Francaise du Froid, 129 Boulevard St. Germain, Paris, France.

"Transport of Fresh Fish by Rail: Individual Shipment, Grouping and Ungrouping," by J. B. Verlot, article, Revue Generale du Froid, vol. 35, no. 9, September 1958, pp. 865-868, illus., printed in French. Association Francaise du Froid, 129 Boulevard St. Germain, Paris France.

#### TROUT:

Tackle Talk and Trout, 18 pp., illus., printed, single copy 50 cents. U. S. Trout Farmers' Association, Box 55, Buhl, Idaho. Describes briefly the four main species of U. S. trout--the rainbow, brook, brown, and native cutthroat. Tells how to catch, care for, and cook trout and presents many helpful illustrations.

U. S. Mountain Trout, 7 pp., illus., printed, single copy 25 cents. U. S. Trout Farmers' Association, Box 55, Buhl, Idaho. A well illustrated handbook describing the handling, cooking, and serving the ever-popular mountain trout.

#### TUNA:

"Le Comité Interprofessionnel du Thon Fixe le Cadre de la Campagne de Pêche à l'Albacore" (The Inter-Professional Committee on Tuna Plans for the Albacore Fishing Season), by L. Plouas, article, La Pêche Maritime, vol. 38, no. 980, November 1959, pp. 675-676, printed in French. La Pêche Maritime, 190, Boulevard Haussmann, Paris, France.

#### VITAMIN A:

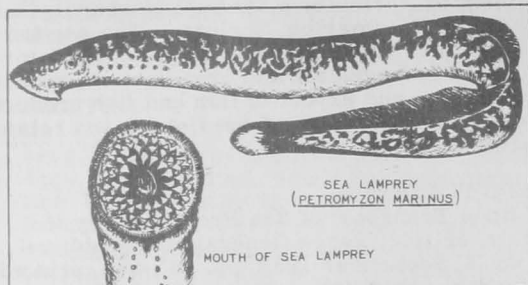
"Isomers of Vitamin A in Fish Liver Oils," by Patricia S. Brown, William P. Blum, and Max H. Stern, article, Nature, vol. 184, no. 4696, October 31, 1959, pp. 1377-1379, illus., printed. Nature, MacMillan & Co., Ltd., St. Martin's St., London W. C. 2, England.



## CALIFORNIA LAMPREYS

Three kinds of lampreys are found in California. These are the Pacific lamprey, the brook lamprey, and the river lamprey.

Lampreys are sometimes confused with eels, and are often called "lamprey eels." The true eels are bony fishes. Lampreys may be distinguished from eels and all other true fishes by the possession of a circular sucking mouth without functional jaws, the lack of paired fins, and the presence of seven external gill openings on each side close behind the head instead of the single gill opening of true fishes.



The eggs hatch into a larval form which is blind, toothless and worm-like. A fleshy hood overhangs the mouth.

The Pacific lamprey is the lamprey most commonly seen in its adult form. The adults attain a length of around two feet and average two to three inches in diameter at greatest girth. They are brown, gray, or blackish in color and quite slippery and slimy to the touch. They are common in coastal streams from Southern California to Unalaska, and are most easily observed during spring upstream migrations.

Adults normally migrate upstream from the ocean during the spring and spawn in gravel, excavating a circular depression by removing stones from the nest sites by means of their sucking discs. The adults die after spawning.

The eggs hatch in a few weeks, and the young lampreys burrow into the stream bottoms where they spend their entire larval existence. The young are believed to feed on materials they strain from the oozy materials on the bottom. Although the exact duration of this stage is not known, it is believed to last three to four years.

The larvae grow gradually, reaching a size of up to 10 inches. As they mature, the fleshy hood surrounding the mouth disappears, and the disc-like sucking mouthparts edged with small, sharp teeth develop. The eyes become functional. This form is parasitic and may attach itself to fishes, rasping a hole through the body covering and feeding upon the body fluids.

Such attacks are often lethal to fish under 12 inches in length, which are unable to rub off or otherwise disengage the lampreys. Adult king salmon in the Klamath River often bear lamprey scars or even attached lampreys. However, the fish apparently survive and are little damaged.

The young lampreys usually migrate to the ocean during the winter or spring. In the ocean, the lampreys maintain their parasitic mode of life, attacking various species of fishes. They have even been known to attach themselves to whales, as evidenced by the resulting scars.

The Pacific lamprey appears to be little utilized for food today, probably more due to prejudice than taste. Professor J. O. Snyder, famed ichthyologist, told of eating lampreys cooked over a green willow grate by Indians in Humboldt County, and said that the meat of these lampreys was rich in oil and very good eating. They are also eaten smoked. Here is a new experience awaiting the curious epicure.

One author states, "In atonement for its unsightly appearance and destructive behavior, the lamprey has partly redeemed itself by delighting the appetites of epicures for centuries. History tells us that the wise King Henry I of England did so love the lowly lamprey that he met his inglorious death by eating too many at one sitting."

Lampreys are looked upon with disfavor because of their habit of parasitizing desirable game fishes. Although the amount of mortality the Pacific lamprey causes in fish populations is not known, the occurrence of parasitic lampreys in California is in no manner comparable to the explosive invasion of the Great Lakes by the Atlantic sea lamprey.

The barrier of Niagara Falls originally excluded the Atlantic sea lamprey from most of the Great Lakes (with exception of Lake Ontario). However, when man provided access for shipping through the Welland Canal, he also left an open door for the lamprey.

The situation on the Pacific Coast is entirely different. The parasitic lampreys have inhabited the waters of the area for thousands of years. There is no problem of invasion of virgin areas, and the fish populations are adjusted to their presence.

The Pacific lamprey spends its entire parasitic existence in salt water and, as a rule, does not feed in fresh water. However, in at least three instances, the construction of dams across coastal streams has resulted in the interruption of normal downstream migration of lampreys to the sea.

In such cases, they have heavily parasitized fish present. After several seasons, the lampreys have died off, although a landlocked population is established in Copco Lake, Siskiyou County.

In general, the only means of control presently known is the blocking of adult runs from migration upstream to spawning areas. This is usually accomplished by providing an overhanging lip on a dam, over which the lampreys cannot climb because of loss of suction. Establishment of electrical barriers has likewise been tried in other parts of the country. The development of selective poisons for lamprey control is now in the experimental stage and shows considerable promise.

The brook lamprey is much smaller, averaging about five inches in length. It occurs from Europe through Siberia to Alaska, and thence southward to Central California. In most areas of California, it is less abundant than the Pacific lamprey.

The adults are comparable in size to the larvae of the Pacific lamprey, and the two are not readily distinguished by casual inspection. In general, its life history pattern is believed to be similar to that of the Pacific lamprey, except that it is not parasitic. Upon changing to an adult, it ceases feeding and growing. The teeth become small and dull or fragmented, and the digestive system becomes nonfunctional. This change takes place during late summer or fall, and the winter is passed in this stage.

The following spring, after spawning, death occurs. From the limited knowledge of its life history and habits, it appears to be of little or no economic importance.

The river lamprey is a small parasitic form occurring in the Sacramento-San Joaquin Delta region, San Francisco Bay, and in the Sacramento River upstream at least to Mill Creek, Tehama County. It is the least abundant of the three species found in California. It also occurs in Oregon, Washington and British Columbia. Mature specimens attain an average length of about seven inches. Little is known of its habits or behavior. (*Outdoor California*, July 1959.)