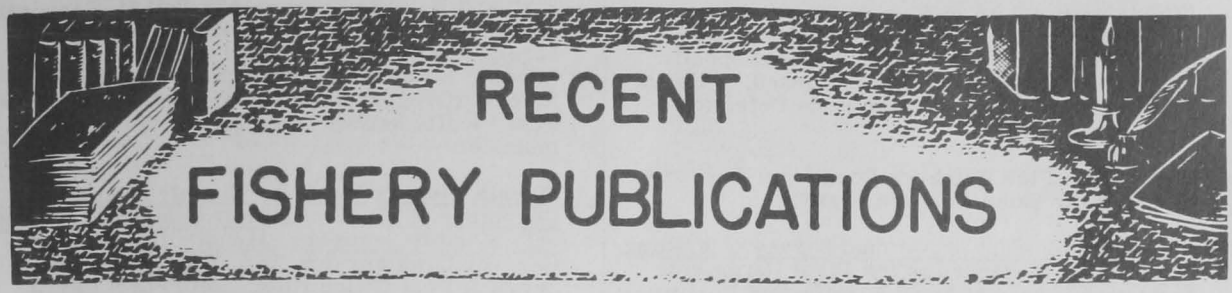

FISH AND WILDLIFE SERVICE PUBLICATIONS

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.
SSR.- FISH.- SPECIAL SCIENTIFIC REPORTS - FISHERIES (LIMITED DISTRIBUTION).
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-1460 - Florida Landings, October 1956, 6 pp.
CFS-1461 - Mississippi Landings, September 1956, 2 pp.
CFS-1463 - Mississippi Landings, October 1956, 2 pp.
CFS-1464 - Georgia Landings, November 1956, 2 pp.
CFS-1465 - Fish Meal and Oil, November 1956, 2 pp.
CFS-1466 - Texas Landings, November 1956, 3 pp.
CFS-1467 - Frozen Fish Report, December 1956, 8 pp.
CFS-1468 - New Jersey Landings, November 1956, 4 pp.
CFS-1469 - Rhode Island Landings, September 1956, 3 pp.
CFS-1470 - Fish Stick Report, 1956 Annual Summary, 2 pp.
CFS-1471 - California Landings, September 1956, 4 pp.
CFS-1472 - Alabama Landings, October 1956, 2 pp.
CFS-1473 - New York Landings, November 1956, 4 pp.
CFS-1474 - Maine Landings, November 1956, 3 pp.
CFS-1475 - Mississippi Landings, November 1956, 2 pp.
CFS-1476 - Rhode Island Landings, October 1956, 4 pp.
CFS-1477 - Ohio Landings, December 1956, 2 pp.
CFS-1478 - Texas Landings, December 1956, 3 pp.
CFS-1479 - Fish Meal and Oil, December 1956, 2 pp.
CFS-1480 - New England Fisheries, 1955 Annual Summary, 7 pp.
CFS-1481 - North Carolina Landings, December 1956, 2 pp.
CFS-1482 - Georgia Landings, December 1956, 2 pp.
CFS-1483 - Florida Landings, November 1956, 6 pp.
CFS-1484 - Alabama Landings, November 1956, 2 pp.
CFS-1485 - Rhode Island Landings, November 1956, 2 pp.
CFS-1486 - New Jersey Landings, December 1956, 4 pp.
CFS-1488 - Shrimp Landings, October 1956, 4 pp.
CFS-1490 - Rhode Island Landings, December 1956, 3 pp.
CFS-1491 - Maine Landings, December 1956, 4 pp.
CFS-1492 - North Carolina Landings, 1956 Annual Summary, 5 pp.

SSR-Fish. No. 187 - Commercial and Sport Shad Fisheries of the Edisto River, South Carolina, 1955, by Charles H. Walburg, 13 pp., illus., processed, October 1956. Gives results of an investigation of the shad fishery of the Edisto River, South Carolina, to determine fishing effort, fishing rate, total catch, size of run, and spawning escapement for 1955. The commercial fishery catch-and-effort data were obtained from logbooks kept by each fisherman. The total catch made by sport fishing was determined by a post-card survey. The catch-and-effort data were combined with a tagging and recovery program, and it was estimated that the fishing rate was approximately 20 percent, the total catch was 11,000 shad, and the size of the run was 56,000 shad (fiducial limits 28,000 to 100,000). Unfortunately, catch-and-effort records for previous years were not available for this stream; therefore, sizes of former runs and escapements could not be determined.

SSR-Fish. No. 193 - Underwater Television Vehicle for Use in Fisheries Research, by R. F. Sand and R. L. McNeely, 19 pp., illus., processed, December 1956. Describes the prototype underwater television vehicle, and reviews its demonstrated utility as a practical research tool in fisheries and related marine investigations. Contains a general description of the underwater television vehicle which was designed by the authors. Construction details of the two sealed pressure vessels are given. The upper double chamber housed the vertical and horizontal control mechanism, and the lower cylindrical chamber housed the television camera. Also describes the control construction, television equipment, power supply, and use of the vehicle in undersea research.

SSR-Fish. No. 195 - Stream Surveys of the Sheepscot and Ducktrap River Systems in Maine, by Floyd G. Bryant, 23 pp., illus., processed, December 1956.

Sep. No. 468 - Some Factors Affecting "Sawdust" Losses During the Cutting of Fish Sticks.

Sep. No. 469 - Iron Sulfide Discoloration of Tuna Cans, No. 4 - Effect of Salt, Oil, and Miscellaneous Additives.

Sep. No. 470 - Research in Service Laboratories (February 1957): Contains these articles--

"Cold-Storage Life of Frozen Fish Improved by Better Handling Practices," "Identification of Tuna Pigments," "Revised Federal Specifications for Breaded Shrimp Proposed," "Use of X-Ray Fluoroscopy for Fish Bone Detection Show Promise."

Sep. No. 471 - Fish Hatchery Food from Anchovies Caught Near Santa Barbara, Calif.

Technical Supplement to National Survey of Fishing and Hunting (A Report on the First Nationwide Economic Survey of Sport Fishing and Hunting in the United States during the Calendar Year 1955), Circular 44-Supp., 98 pp., processed. This supplement contains detailed information on the sampling plan and other survey techniques used by the firm of Crossley, S-D Surveys, Inc., in conducting the fishing and hunting survey under contract with the Fish and Wildlife Service. It discusses the technique of the survey; the sample (condensed description); sample design for national study of hunting and fishing; general instructions; sampling procedure; and contains samples of questionnaires, memory aids, and other materials used in the survey.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Life History of Lake Herring of Green Bay, Lake Michigan, by Stanford H. Smith, Fishery Bulletin 109 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 57, pp. 87-138), 55 pp., illus., printed, 35 cents, 1956.

Shrimp Tips from New Orleans, Circular No. 41, 17 pp., illus. in color, printed, 15 cents. A beautifully-illustrated shrimp recipe book in color with 18 different ways of preparing shrimp. Ingredients of all of the recipes such as those for Shrimp Amandine, Remoulade, Creole of Jambalaya, are available at any market and are usually already in the home kitchen.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

Boston Fishery Products Monthly Summary, December 1956, 15 pp.; Boston Fishery Products Monthly Summary, January 1957, 15 pp. (Market News Service, U.S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Landings and ex-vessel prices by species for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; and Boston frozen fishery products prices to primary wholesalers; for the months indicated.

Gulf Monthly Landings, Production and Shipments of Fishery Products, January 1957, 5 pp. (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; and wholesale prices of fish and shellfish on the New Orleans French Market; for the month indicated.

(Seattle) Monthly Summary - Fishery Products, January 1957, 6 pp. (Market News Service, U.S. Fish and Wildlife Service, 421 Bell St. Terminal, Seattle 1, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Oregon) wholesale dealers; also Northwest Pacific halibut landings; for the month indicated.

California Fishery Products Monthly Summary, December 1956, 10 pp.; California Fishery Products Monthly Summary, January 1957, 10 pp. (Market News Service, U.S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of raw tuna and tuna-like fish, herring, mackerel, anchovies, and squid; pack of canned tuna, mackerel, herring, anchovies, and squid; market fish receipts at San Pedro, Santa Monica, San Diego, and Eureka areas; California imports; canned fish and frozen shrimp prices; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, January 1957, 4 pp.; Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, February 1957, 4 pp. (Market News Service, U.S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Fishery production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Ocean City, and Cambridge; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the months 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 ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALASKA:

1955 Annual Report, Report No. 7, 152 pp., illus., printed. Alaska Department of Fisheries, 229 Alaska Office Bldg., Juneau, Alaska. Summarizes the activities of the Alaska Fisheries Board and the Alaska Department of Fisheries for 1955. The statistical tables cover the preceding 10-year period while the financial statement covers the fiscal year from April 1, 1955, to March 31, 1956. The 1955 research program of the Division of Biological Research was divided into three main projects. Research on the early life history of red salmon was carried out at Kitoi Bay. Taku River studies on the population dynamics of king salmon and catch and escapement indices of red, pink, chum, and silver salmon were continued. The study of the king crab at Kodiak was also continued. Also describes the inspection, predator control, sport fish, and watershed management programs. The statistical part of the report contains data on the value of the canned salmon by species, 1946-55; number of canneries and the salmon pack, 1946-55; salmon catch by gear, species, and district, 1955; quantity and value of Alaska fisheries

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landings, 1946-55; and quantity and value of Alaska fisheries products prepared for market, 1946-55. In addition to a financial statement, the report concludes with a discussion of future plans of the Department.

BAIT FISH AND FISHING:

Contribution to the Problems of Bait Fish Capture and Mortality Together with Experiments in the Use of Tilapia as Live Bait, by Vernon E. Brock and Michio Takata, Industrial Advisory Council Grant No. 49, Final Report, 39 pp., illus., processed. Division of Fish and Game, Board of Agriculture and Forestry, Honolulu, Hawaii, January 1955.

BRAZIL:

Estatistica Brasileira da Pesca, 1950/1954 (Brazilian Fishery Statistics) 23 pp. tables, processed in Portuguese. Ministerio de Agriculture, Servicio de Estatistica da Producao, Rio de Janeiro, Brazil.

BYPRODUCTS:

"Condensed Fish Solubles in Turkey Rations," by R. D. Carter and J. W. Wyne, article, Feedstuffs, vol. 29, no. 2, January 12, 1957, pp. 10-11, printed, single copy 20 cents. Feedstuffs, Box 67, Minneapolis 1, Minn.

"Processing of Cod and Haddock Viscera: 1. Laboratory Experiments," by H. C. Freeman and P. L. Hoogland, article, Journal of the Fisheries Research Board of Canada, vol. 13, no. 6, November 1956, pp. 869-877, illus., printed. Queen's Printer, Ottawa, Canada. Annually, large amounts of cod and haddock viscera (minus livers) are discarded by the fishing industry. The chemical composition of this offal makes it a possible raw material for production of additives to animal feeds. Various processes that would lead to a method of production of such preparations were investigated and are reported in the present paper. Autolysis of fresh viscera in the presence of sodium nitrite as a preservative was found most attractive. Optimum conditions for this process were established and various methods of drying these autolysates were investigated.

CALIFORNIA:

California Cooperative Oceanic Fisheries Investigations, Progress Report, 1 April 1955 to 30 June 1956, 44 pp., illus., printed. State Fisheries Laboratory, California Department of Fish and Game, Terminal Island, Calif. A report on the progress of the California Cooperative Oceanic Fisheries Investigations for the period 1 April 1955 to 30 June 1956. In this report, the research agencies have reviewed their activities during the reporting period and have presented the following articles summarizing the status of their knowledge of three important marine fisheries: (1) "Anchovy," by Daniel J. Miller; (2) "Jack Mackerel," by John E. Fitch; (3) "Pacific Mackerel," by John E. Fitch; and (4) "Eggs and Larvae of Anchovy, Jack Mackerel," by Elbert H. Ahlstrom. Included in the report is an annotated list of publications which have arisen from research conducted under the investigations during the period 1 January 1955-30 June 1956.

CANADA:

(British Columbia) Provincial Department of Fisheries Report (with appendices) for the Year Ended December 31st, 1955, 134 pp., illus., printed. Provincial Department of Fisheries, Victoria, B. C., 1956. The first part of this report is devoted to an analysis of British Columbia's 1955 production and value of fishery products, the canned salmon pack, and a review of the salmon canning industry. Also discussed are the other canning industries (herring, tuna, and shellfish), the production of processed fish (mild-cured salmon, dry-salted salmon, and dry-salted herring), the halibut fishery, fish oil and fish meal, net fishing in nontidal waters, condition of British Columbia's salmon-spawning grounds, value of Canadian fisheries and the standing of the provinces for 1954, and species and value of fish caught in British Columbia. A report on the herring investigation and the 1955 report of the biologist on the oyster and clam investigations are included. The second section consists of the following articles: "Contributions to the Life History of the Sockeye Salmon (No. 41)," by D. R. Foskett; "The Status of the Major Herring Stocks in British Columbia in 1955-56," by F. H. C. Taylor, A. S. Hourston, and D. N. Outram; "Phytoplankton and Physical Conditions in Ladysmith Harbour," by C. D. McAllister; "The British Columbia Shipworm;" "Report of the International Pacific Salmon Fisheries Commission, 1955;" "Report of the International Pacific Halibut Commission, 1955;" and "Salmon-Spawning Report, British Columbia, 1955." The report concludes with detailed statistical tables on the British Columbia fisheries.

Journal of the Fisheries Research Board of Canada, vol. 13, no. 5, October 1956, pp. 599-758, illus., printed. Fisheries Research Board of Canada, Ottawa, Canada. Contains, among others, the following articles: "The Choice and Solution of Mathematical Models for Predicting and Maximizing the Yield of a Fishery," by Kenneth E. F. Watt; "Factors Influencing the Survival of the Lemon Sole (Parophrys vetulus) in Hecate Strait, British Columbia," by K. S. Ketchen; "On the Distribution of Young Sockeye Salmon (Oncorhynchus nerka) in Babine and Nilkitkwa Lakes, B. C.," by W. E. Johnson; and "The Oceanography of Hebron Fjord, Labrador," by David C. Nutt and Lawrence K. Coachman.

The First Ten Years of Commercial Fishing on Great Slave Lake, by Dr. W. A. Kennedy, Fisheries Research Board of Canada Bulletin 107, printed, 50 Canadian cents. The Queen's Printer, Ottawa, Canada. This bulletin is divided into two parts. The first part gives background information on the fishery of Great Slave Lake such as the physical and biological characteristics of the lake, the fish it contains, and the history and operational method of the fishery. The second part covers the scientific study that has been carried out prior to and since the inception of the fishery.

Progress Reports of the Pacific Coast Stations, no. 107, 32 pp., illus., printed. Fisheries Research Board of Canada, Ottawa, Canada,

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November 1956. Among the articles included are: "The Raft Culture of the Pacific Oyster in British Columbia," by D. B. Quayle; "The Effectiveness of Various Preservatives on Plywood in Preventing Attack by Shipworms and Gribbles," by F. H. C. Taylor; "Further Results from Tagging Experiments on Lingcod," by B. M. Chatwin; "The Distribution and Abundance of Early Post-Larval Stages of the British Columbia Commercial Crab," by T. H. Butler; and "Pacific Salmon Water?" by John P. Tully and A. J. Dodimead.

CANNING:

España Pesquera (Fishing Spain), vol. 1, no. 9, October 1956, 32 pp., illus., printed in Spanish. Sindicato Nacional de Pesca, Paseo del Prado, 20, sexta planta, Madrid, Spain. Contains, among others, the following articles: "Meeting of the Third Universal Congress of Canning Held in Rome;" "Speech Delivered by the President of the Congress;" "Summary of Some of the Reports of the Committees;" "The 11th International Fair of Canned and Packaged Goods held at Parma;" "Interviews with: M. Rene Manaut, President of the Permanent Committee of Canning; don Antonio Alfageme del Busto, President of the National Group; and don Jose Royo Iranzo, Pharmaceutical Chemist and Researcher;" and "Studies and Investigations of Canning Production in Morocco."

CARIBBEAN:

"Fisheries," article, The Caribbean, vol. 10, no. 4, November 1956, pp. 91-94, illus., printed. The University of Florida Press, Gainesville, Fla. Describes the progress made in the fisheries of the Caribbean area for the past ten years. During the period under review, attention was paid to the development of the fishing industry in the Caribbean area as a means of local food production, as an exporting industry, and as a means of providing employment. Between 1946 and 1956, legislation to protect, promote, and properly organize the fishing industry was passed in various countries. Describes development in the cultivation of fish; marketing, distribution, and storage of fish; fish processing; manufacture of fish meal; new methods of fishing; crawfish and lobster industries; formation of cooperatives; marine surveys and exploration; and the establishment of research stations throughout the Caribbean area.

CHILE:

Summary of Investigations on the Pelagic Fish Survey of Chilean Waters with Special Reference to the Swordfish, Marlins, and Tunas, by John A. Manning, No. 57-4, 14 pp., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla.

COMMERCIAL FISHERIES:

Problems of the Commercial Fisheries Conservation, Technology, Economics, Contribution No. 19, 15 pp., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 84, 1955, pp. 299-313.) University of Washington, School of Fisheries, Seattle, Wash.

COMMISSIONS:

(International North Pacific Fisheries Commission) Annual Report for the Year 1955, 72 pp., illus., printed. International North Pacific Fisheries Commission, 209 Wesbrook Bldg., University of British Columbia, Vancouver 8, B. Canada, 1956. The Commission was established by Convention between Canada, Japan, and the United States for the conservation of the fisheries resources of the North Pacific Ocean o June 12, 1953. The present report contains a summary of action by the Commission at its 1955 annual meeting, which began on October in Tokyo, a summary of administrative activities for the year, and progress reports on re search conducted by the member governments under the Commission's program. The resea program undertaken by the Commission is at present concentrated on determining the cont nental origin of stocks of salmon on the high seas and on determining whether there is a need for joint conservation measures for the king crab stock of the eastern Bering Sea. Ca ada's part in the program of research include (1) a study of the skeletal anatomy of salmon, to seek structural differences which could be used to distinguish stocks of various origins; (2) an attempt to find parasites which can be u as indicators of the origin of salmon occurrin on the high seas; (3) an attempt to catch and t small sockeye, pink, and chum salmon to indi cate migrations away from rivers of origin a the fisheries to which various stocks contribu and (4) cooperation in a study of the oceanogr phy of the North Pacific, to provide backgrou for understanding salmon distribution and mo ments. Progress in all these fields was made 1955 and is summarized in the present report Japan's report summarizes operations of the mothership-type salmon fisheries in the Aleu area during 1955 and presents data regarding salmon sampled aboard the motherships and collected by the government research vessel, No. 1 Tsukiyama Maru, during the 1955 seas A summary of king crab research conducted Japan in the eastern Bering Sea in 1955 is al included. The United States report discusses offshore distribution of salmon, identificatio stocks, study of movements by tagging, and anography; records of the commercial catch king crabs, distribution and abundance of kin crabs, relation of currents to distribution of young crabs, identification of stocks, growth and age determination, study of movements crabs by tagging, and observations on the m tality of king crabs released from a trawl fish

CRABS:

Observations on the Life Histories and the Di tribution of the Xanthidae (Mud Crabs) of Ch peake Bay, by Edward Parsons Ryan, Contr bution no. 104, 25 pp., illus., printed. (Re printed from The American Midland Natural vol. 56, no. 1, July 1956, pp. 138-162.) Ch peake Biological Laboratory, Maryland Dep ment of Research and Education, Solomons,

CRAYFISH:

An Injection Method for Marking Crayfish, by Keith V. Slack, Contribution No. 564, 3 pp. printed. (Reprinted from Department of Zoo 1955, pp. 36-38.) Indiana University, Depa ment of Zoology, Bloomington, Ind.

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CUBA:

Cordel y Anzuelo (Line and Hook), by Adolfo Naranjo Betancourt, 252 pp., illus., printed in Spanish with a Spanish-English fish glossary. Banco de Fomento y Agricola e Industrial de Cuba, Seccion de Asuntos Pesqueros, Havana, Cuba, 1956. Discusses fisheries in Cuba and presents detailed descriptions of the 77 most important fishes found in Cuban waters. A picture of each fish is shown and also given are: its family name; species name in Latin; common Cuban name; type of fishery--whether commercial, sport, or both; places in Cuba where fished; outstanding characteristics; size--minimum, average, and maximum; what it feeds on; bait used and description of strike; season when most prevalent; spawning season; quality of its meat; commercial importance; and methods used for fishing. The book also has sections on the habitat of Cuban fish; markets; lists of fish family names and member species with equivalent common names; importance of the sardine; causes of death of live bait; the relationship of the geographic location of Cuba to its oceanography; importance of spiny lobster; facts about ambergris; the sponge industry; eels; oysters; bull frogs; fish hatcheries, crustaceans, turtles, and sponges; crab; statistical review of Cuban fishery during 1952; and a list of Cuban fish names mentioned and their English equivalents.

ELECTRICAL FISHING:

Die Electrofischerei (Electrofishing), by H. W. Denzer, Handbuch der Binnenfischerei Mitteleuropas, Band 5, Lieferung 3, 233 pp., 127 illus. and 49 tables, printed. E. Schweitzerbart'sche Verlagsbuchhandlung, Stuttgart, Germany, 1956. A clear and understandable handbook on the theoretical and practical problems of electrofishing. In addition to presenting stimulating suggestions for the future development of this type of fishing technique, the author has reviewed the historical development of electrofishing. There is also a detailed description of the requirements for the use of this method of capture, as well as descriptions of the physiological effects of electrical current and the factors that regulate the responses of the fish in an electrical field. The limitations of electrofishing are emphasized; and considerable space is allotted to the use of electrofishing equipment, including descriptions of a variety of European units. The author has outlined the methods and procedures of electrofishing as they apply to practical problems.

The Elementary Practice of Electrical Fishing in Fresh Water, Fisheries Notice 36, 15 pp., illus., printed. Ministry of Agriculture, Fisheries and Food, Whitehall Place, London, S. W. 1, England, August 1956. This leaflet was written to satisfy a demand for a simple, practical guide for those who are not electricians, but who propose to use an electrical method for purposes of fish conservation. Discusses the applicability, safety, and legality of electrical methods of fishing in fresh water; the electric field in water; action of electricity on fish; apparatus used in electric fishing; and electrode switch control. Also discusses fishing methods with alternating current and with direct current; practical considerations affecting the fishing; interrupted currents; and methods of production. A list of other papers on electrical fishing is included.

FISHERIES AGREEMENTS:

"Fish Can Be International," by Edwr Allen, article, United States Naval Institute Proceedings, October 1956, printed, 50 cents. United States Naval Institute, Annapolis, Md. Reviews the background of the various international fisheries agreements, beginning with the North Pacific Halibut Treaty--the first instance of international fishery management through a joint commission.

FISH PROTEINS:

"Fish Proteins and Their Utilization," article, Journal of Scientific and Industrial Research (India), vol. 14A, no. 9, p. 453, printed. Council of Scientific and Industrial Research, Delhi, India, 1955. The Department of Biochemistry, Institute of Science, Bombay, India, has been experimenting for the last four years on the preparation and utilization of proteins from fish, particularly from the waste muscle of shark, skate, ray, fish meal, etc. Considerable progress has been made in the preparation of edible proteins devoid of fishy smell. The fish proteins are easily digestible and contain all the essential amino acids in a fairly good proportion. The fish proteins have been prepared by a simple method similar to that described for the manufacture of Wiking Eiweiss--a German fish protein product. In vitro digestion with proteolytic enzymes and microbiological assay of the protein hydrolyzates for amino acids revealed that the fish proteins compare favorably with casein. The high concentrations of lysine, cystine, and other amino acids in fish proteins make it a valuable supplement to diets composed mainly of cereals, pulses, and vegetables. The fish proteins may find application in various industries like textiles, leather, dyes, confectionery, plastics, synthetic resins, and pharmaceuticals.

FLORIDA:

Papers from the Oceanographic Institute No. 2, Florida State University Studies Number Twenty-Two, 161 pp., illus., printed, $1. The Florida State University, Tallahassee, Fla., 1956. Contains, among others, the following papers: "The Demand for Florida Mullet," by William S. Engelson and Marshall R. Coldberg; and "The Fishes of Alligator Harbor, Florida, with Notes on Their Natural History," by Edwin B. Joseph and Ralph W. Yerger.

Quarterly Report on Fisheries Research, December 1956, No. 57-5, 8 pp., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla. A report to the Florida State Board of Conservation on fisheries research covering small shrimp, spotted weakfish, snook, tarpon, sailfish, and gamefish. Studies were continued using the antioxidant sodium bisulfite to retard the development of black spot in shrimp. Samples of fresh frozen mackerel, treated with the antioxidant Ionol and tested over a period of one year, showed considerably less rancidity than did the nontreated samples.

Annotated Check-List of the Marine Fauna and Flora of the St. George's Sound--Apalachee Bay Region, Florida Gulf Coast, Contribution No. 61, 85 pp., processed. The Oceanographic

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Institute, Florida State University, Tallahassee, Fla., October 1956.

FLUKE:

"Long Island's Fluke (A Million Dollar Fishery)," by John C. Poole and Irwin M. Alperin, article, The New York State Conservationist, vol. 11, no. 3, December-January 1956-1957, pp. 16-17, illus., printed, single copy 50 cents. The Conservationist, Room 515, Arcade Bldg., Albany 1, N. Y. Describes some features of the early life history of the fluke or summer flounder and value to sports fishermen and commercial fishermen of Long Island, N. Y. It estimates conservatively that sport fishermen take about 2,000,000 pounds of fluke from Great South Bay and adjacent bays in an average season. The fluke catch per unit-of-effort in Great South Bay for 1938, 1955, and 1956 is shown by type of sport-fishing craft.

FOOD AND AGRICULTURE ORGANIZATION:

The Work of FAO, 1954-55 (Report of the Director-General), 130 pp., printed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1955. While no year can be picked out of its context in the history and development of FAO, this report concentrates upon problems met and work accomplished since the last report to the council in 1954. Without detail, it relates to each Regular Program line of activity the pertinent projects under the Expanded Technical Assistance Program, thus reflecting the real and growing integration of direct technical advisory services to the continuing fundamental program. The chapter on fisheries shows an increase during the past year in the work of the Fisheries Division under both the Regular and the Expanded Technical Assistance Programs, and discusses its accomplishments. Work on the survey of living aquatic resources of the world was pressed forward and so was the task of bringing about international improvements in the standards of methods of fishery statistics. Developments during the year in fisheries biology, fisheries technology, fishery economics and statistics, and regional activities are discussed in detail.

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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 sales basis, but have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization, Viale delle Terme di Caracalla, Rome, Italy.

Report to the Government of Chile on Increasing Fish Consumption (based on the work of John Fridthjof), FAO Rpt. No. 271, 53 pp., processed, April 1954.

Informe sobre la Langosta Migratoria de la America Central y Mexico (Report on the Migratory Spiny Lobster of Central America and Mexico), FAO Rpt. No. 287, 23 pp., processed in Spanish, August 1954.

Informe al Gobierno del Ecuador sobre Fomento de la Pesca Maritima (Report to the Government of Ecuador on the Development of Maritime Fishery), FAO Rpt. No. 325, 25 pp., processed in Spanish, January 1955.

Report to the Government of Liberia on Fishing Boats, Gear and Methods, by Hubertus van Pel, FAO Rpt. 322, 36 pp., illus., processed, November 1954. Discusses a survey to improve the fishing methods in Liberia. The first two phases of the program covered preparatory work ashore, including the training of Liberian assistants in net making and the erection of certain shore installations. The third phase consisted of the main project, the demonstration of, and training in, improved fishing methods from small mechanized boats.

Informe al Gobierno de la Republica de Panama sobre Investigacion de los Recursos Camaroneros, Octubre 1952-Octubre 1953 (Report to the Government of Panama on the Shrimp Resources, October 1952-October 1953), by Leslie Scattergood, FAO Rpt. No. 326, 76 pp., illus., processed in Spanish, March 1955.

Informe al Gobierno de la Republica Dominicana sobre Piscicultura (Report to the Government of the Dominican Republic on Fish Culture), by S. Y. Lin, FAO Rpt. No. 346, 17 pp., illus., printed in Spanish, December 1954.

Report to the Government of India on Development of the Sundarbans Fisheries in West Bengal, FAO Rpt. No. 347, 24 pp., illus., processed, December 1954. A report on the development of a program for increasing fish production in the brackish waters of the State of West Bengal through the introduction of suitable foreign gear and craft; improvement of existing indigenous gear and craft; improvement of the present water transport system for carrying fish; and training local fishermen to organize and operate fishing ventures in brackish waters.

Report on the Indo-Pacific Fisheries Statistics Training Center held in Bangkok, Thailand, 19 June to 31 July, 1952, by G. L. Kesteven, FAO Rpt. No. 357, 59 pp., processed, February 1955. The principal aim of the Center was to give practical instruction in statistical work for fisheries to officers of governments of the region, to equip them better to undertake the statistical program for these industries. The organization of the Center in Bangkok, work of the Center, and results achieved are discussed.

Report to the Government of Turkey on Fishery Biology, FAO Rpt. No. 391, 25 pp., processed, July 1955. This report deals with the work on fishery biology conducted by Dr. G. A. Rounsefell who was on loan to FAO from his position with the Fish and Wildlife Service to assist the Government of Turkey in promoting fishery development.

FOOD CONSUMPTION:

Food Consumption of Households in the United States, Household Food Consumption Survey 1955 Report No. 1, 196 pp., processed, $1.25. U. S. Department of Agriculture, Washington, D. C., December 1956. (For sale by the Superintendent of Documents, U. S. Government

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Printing Office, Washington 25, D. C.) This report contains a portion of the data from the U. S. Department of Agriculture's nationwide Survey of Household Food Consumption made in the spring of 1955. The survey was part of the Department's broad program of research on the marketing and utilization of farm products and on family dietary levels. The 6,060 households included in the survey were from all over the country, in urban, in rural nonfarm and farm areas. These households represent all income classes. The report gives information on patterns of consumption and money value for over 200 food items, including fish and shellfish. The information will be useful to many kinds of food businesses and to others in determining the demand for the major types of foods.

FROZEN FISH:

Frozen Fish (Improved Quality and Packing as a Way to Improved Marketing and Consumption), Project No. 325, 160 pp., illus., printed, US$1.25. O. E. E. C. Mission, Suite 61, 2002 P St., N. W., Washington 6, D. C. Following a recomendation of the O. E. E. C. Sub-Committee on Fisheries, a training course on "The Improved Quality and Packing of Frozen Fish" was held at Kiel, Germany, from March 14-19, 1955. This training course, which is the subject of the present publication, was attended by some 50 delegates from 14 member countries of O. E. E. C. The report was compiled by the course organizers and includes the country statements presented at the training course, the technical papers read, and a summary of the conclusions and recommendations reached by the participants during their discussions. The purpose of the workshop was to provide the participants with a comprehensive survey of recent developments in the fish-freezing industry and allow for detailed discussions not only on technical questions, but also on economic problems, ranging from the condition of the raw material and the various methods of deep-freezing down to the particularly interesting methods of transport and distribution. It was one of the main objects of the workshops that every participant should acquire practical knowledge from the papers and group discussions for application in his home country. The workshop, therefore, was not limited to theoretical discussions, but gave prominence to methods of immediate practical application throughout the fish industry. But first of all, it was the object to demonstrate how important the deep-freezing of fish is to promote an increase in the consumption of this commodity. Part I of the present report describes the fish-freezing industry in the participating countries. Part II gives the full text of the technical papers delivered at the training course and summaries of discussions. The program and itinerary of the workshop and a list of the participants are also included.

GEAR:

"A Comparison of Mesh-Measuring Methods," by B. B. Parrish, R. Jones, and J. A. Pope, article, Journal du Conseil, vol. XXI, no. 3, June 1956, pp. 310-318, illus., printed, single copy Kr. 12 (US$1.74). Messrs. Andr. Fred. Høst & Søn, Bredgade, Copenhagen, Denmark.

"On the Selection of Hake and Whiting by the Mesh of Trawls," by J. A. Gulland, article, Journal du Conseil, vol. XXI, no. 3, June 1956, pp. 296-309, illus., printed, single copy Kr. 12 (US$1.74). Messrs. Andr. Fred. Høst & Søn, Bredgade, Copenhagen, Denmark.

GENERAL:

1954 Census of Manufacturers, Advance Report (Canning, Preserving, and Freezing), Series MC-20-3, 16 pp., processed, 10 cents. Bureau of the Census, U. S. Department of Commerce, Washington 25, D. C. This advance report includes selected preliminary statistics from the 1954 Census of Manufacturers for the canning, preserving, and freezing group of industries. Among the individual industries included in this report are the following: Canned Seafood Industry (S. I. C. Code 2031)--represents manufacturing establishments primarily engaged in cooking and canning fish, shrimp, oysters, clams, crabs, and other fishery products; Cured Fish Industry (S. I. C. Code 2032)--represents manufacturing establishments primarily engaged in smoking, salting, drying, or otherwise curing fish for the trade; and Packaged Seafood Industry (S. I. C. Code 2036)--represents manufacturing establishments primarily engaged in preparing fresh or frozen packaged fish or other fishery products; and also includes establishments primarily engaged in the shucking and packing of fresh oysters in nonsealed containers. This advance report gives general statistics (employment, payrolls, cost of materials, value of shipments, etc.) for 1954 and 1947 by regions and states, and the quantity and value of fishery products shipped by all manufacturing establishments for the United States.

Diseases of Fishes, by C. Van Duijn, Jr., 187 pp., illus., printed. Water Life, Dorset House, Stamford St., London, S. E. 1, England. A comprehensive and well illustrated book dealing with fish diseases and their treatment. The introduction discusses the sources of infection, general indications of good and ill-health, diagnosis of disease, and anatomy of fish. There are eight chapters dealing with skin parasites and infections; diseases of the gills; diseases caused by sporozoans; diseases caused by bacteria and viruses; diseases of the eye; diseases of the internal organs; miscellaneous complaints; and the medicine chest. Not only will the most modern and effective cures be found here but also methods of treatment which have been advocated in the past and must now be considered obsolete, the reasons being given why they can no longer be recommended. In this way the material, as it is presented, may be considered comprehensive, combining information from British, American, and Continental sources with the writer's personal experiences. The details should be comprehensible to aquarists in different parts of the world as prescriptions are given not only in British units but in American and metric units as well.

Economic Report of the President (Transmitted to the Congress, January 23, 1957), House Document No. 29, 85th Congress, 1st Session, 210 pp.,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

illus., printed. United States Government Printing Office, Washington 25, D.C., 1957.

Fishes: A Guide to Fresh- and Salt-Water Species, by Herbert S. Zim and Hurst H. Shoemaker, A Golden Nature Guide, 160 pp., illus., printed, $1. Simon and Schuster, Inc., 630 Fifth Ave., New York 20, N.Y. A general guide for identifying fish on a fishing trip or in an aquarium.

(Interstate Commerce Commission) 70th Annual Report, November 1, 1956, House Document No. 12, 85th Congress, 1st Session, 240 pp., illus., printed. U.S. Government Printing Office, Washington 25, D.C., 1957. The purpose of this report is to give an account of the Interstate Commerce Commission's activities for the period extending from November 1, 1955 to October 31, 1956, and to inform the Congress of problems and conditions in transportation which require its early consideration. These problems are discussed, and where legislation is deemed necessary, specific recommendations are made in the final chapter.

Limnology and Oceanography, vol. 1, no. 1, January 1956, printed (subscription rate for libraries and non-members of the Society, $10 per year). American Society of Limnology and Oceanography, Woods Hole Oceanographic Institution, Woods Hole, Mass. A new serial publication for those concerned with aquatic sciences and to provide a common medium for technical papers on the varied specialties which unite to increase an understanding of the aquatic environment. The first volume includes the following papers: "Environmental Factors Affecting Growth in Venus mercenaria," by D. M. Pratt and D. A. Campbell; "Algal Indicators of Trophic Lake Types," by D. S. Rawson; "Population Dynamics of the Marine Clam, Mya arenaria," by J. C. Ayers; "Deep Standing Internal Waves in California Basins," by K. O. Emery; "The Stress-Drop Jet in Lake Mendota," by R. A. Bryson and W. W. Bunge, Jr.; "Artificial Eutrophication of Lake Washington," by W. T. Edmondson, G. C. Anderson, and D. R. Peterson; "Observations on Dinoflagellate Blooms," by L. R. Pomeroy, H. H. Haskin, and R. A. Ragotzkie; and "Photosynthesis in the Ocean as a Function of Light Intensity," by J. H. Ryther.

The Use of Copper Sulphate to Increase Fyke Net Catches, by William A. Tompkins and Colton Bridges, 12 pp., illus., processed. Division of Fisheries and Game, Department of Natural Resources, 15 Ashburton Place, Boston 8, Mass.

The World of Water, by George G. Harrap and Co., printed, 13s. 1d. (about US$1.85). Piscatorial Press, Ltd., 110 Fleet St., London, E.C. 4, England. Tells of the many types of marine life under the sea, their weapons of defense against enemies and the struggles between sea animals for survival.

HAWAII:

Konohiki Fishing Rights, by Richard H. Kosaki, Report No. 1, 41 pp., illus., processed. Legislative Reference Bureau, University of Hawaii, Honolulu, Hawaii, 1954. Discusses arguments for and against condemnation of the ancient Hawaiian Konohiki fishing rights--private ownership rights over ocean fisheries--which are recognized as property rights by the United States Supreme Court.

HYDROGRAPHY:

"The Influence of Hydrographic Conditions on the Behavior of Fish," compiled by Richard H. Fleming, article, FAO Fisheries Bulletin, vol. IX, no. 4, October-December 1956, pp. 181-196, illus., printed, single copy 30 cents. Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N.Y. In the introduction of this preliminary literature survey, the author states that, "A commercial fishery will be profitable only if a high concentration of fish may be found in a restricted locality. In order to be able to predict the locality and time of aggregation of commercial fish, the factors determining such aggregations must be identified and measured. Furthermore, the factors which determine successful propagation of the fish stock, its size, and survival rate must be found and identified too, in order to be able to take proper steps in management and fish conservation." The notes that follow discuss organic production in the open oceans, food chains in the ocean, temperature changes, salinity of the water, other physical and chemical environmental factors, currents, and food and feeding habits.

IDAHO:

Statewide Fishing Harvest Survey, 1955 (Annual Progress Report for Investigations Projects), by Forrest R. Hauck, Federal Aid to Fisheries Project 18-R2, 10 pp., illus., printed. Fish and Game Department, Boise, Idaho, 1956.

INDIANA:

Fish and Fishing in Spear Lake, Indiana, by W. E. Ricker, Contribution No. 588, 45 pp., illus., printed. (Reprinted from Department of Zoology, 1955, pp. 117-161.) Indiana University, Department of Zoology, Bloomington, Ind.

IOWA:

Quarterly Biology Reports, vol. VIII, no. 3, July-August-September 1956, 44 pp., processed. State Conservation Commission, East 7th and Court St., Des Moines, Iowa. Contains the following articles: "Summary of the Cooperative Exploratory Fishing Operations in the Wisconsin-Illinois-Iowa Sections of the Mississippi River, 1956," by R. E. Cleary; "An Experimental Treatment of a Segment of the Des Moines River in Iowa to Increase Desirable Fish by Suppressing Undesirable Forms," by Harry M. Harrison; "Selective Poisoning of Gizzard Shad in Storm Lake--Preliminary Report," by Earl Rose; "Results of Early Summer Creel Census of Five Northern Iowa Lakes, 1956," by Tom Moen; and "The 1956 Artificial Lakes and Reservoir Fisheries Survey," by Jim Mayhew.

JAPAN:

The Tohuku Journal of Agricultural Research, vol. VI, no. 4, pp. 285-392, illus., printed, March 1956. Faculty of Agriculture, Tohuku University, Sendai, Japan. Contains, among others, the following articles: "Biological Studies on the

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Population of the Saury, Cololabis saira (Brevoort). Part 2--Habits and Migrations," by M. Hatanaka; and "Comparative Biochemical Studies on Aquatic Animals. I.--Calcium Turnover of the Freshwater Fish and Shellfish," by Motokazu Asano, Masao Ito, and Toshio Kumagai.

REPUBLIC OF KOREA:

Rehabilitation & Reconstruction Program on Marine Affairs, 1957-1961, 92 pp., illus., printed. Office of Marine Affairs, Seoul, Republic of Korea, 1956. A detailed report on Korea's rehabilitation and reconstruction program. Part I describes the following projects: (1) oyster cultivation which will replace laver (a species of seaweed) culture; (2) replacement of existing old and unseaworthy vessels; and (3) completion of the second tidal basin work at Inch'on. Part II covers a 5-year plan on fisheries rehabilitation; shipbuilding; modernization of stevedoring facilities; and harbor rehabilitation.

MAINE:

Alewife Management in Maine, by Frederick T. Baird, Fisheries Circular No. 18, 7 pp., processed. Department of Sea and Shore Fisheries, State House, Augusta, Maine, November 1956. A report on the alewife management program in Maine, presenting biological information which might serve to change to some degree the recommendations for the management of the fishery. The recommendations made in 1953 remain basically unchanged and are as follows: (1) all areas should be carefully checked for their production capacity and the possibility of even greater production either by opening more of the watershed or more efficient use of that portion which is available; (2) more rapid development of potential areas should be encouraged; (3) a careful check of fishway construction and maintenance should be carried on; and (4) where new runs are being developed, plans should be made for the planting of adults as required. The author concludes that (1) under present conditions, alewife production can be increased by (a) the improvement of existing runs, and (b) the rehabilitation of runs which are no longer commercially productive; (2) existing markets are capable of absorbing additional production; and (3) it is now feasible to develop small producing areas which are closely joined geographically to form a single development and marketing unit.

The Maine Department of Inland Fisheries and Game, by Ron Speers, Information and Education Division Pamphlet No. 4, 14 pp., illus., printed. Department of Inland Fisheries and Game, Augusta, Maine, 1956.

MALAYA:

Report of the Fisheries Division, 1955, Ministry of Commerce and Industry, 27 pp., printed. Ministry of Commerce and Industry, Singapore, Malaya. Includes a general review of the fishing industry of the Federation of Malaya, availability of fresh fish, prices of fresh fish, trade in dried salt fish and certain marine products, and cost of fishing materials.

MARINE LIFE:

The Underwater Guide to Marine Life, by Carleton Ray and Elgin Ciampi, 338 pp., illustrated by Teiji Takai, printed, $8.75. A. S. Barnes and Company, 232 Madison Avenue, New York 16, N. Y., 1956. As suggested by the title, this is specifically a book for the large and growing group who have discovered the fascinating world under water and who insist upon diving to explore it with or without special breathing apparatus. The authors have included introductory chapters on marine biology and oceanography which are readable and interesting condensations of those phases of the subjects most important to an understanding of the varied and colorful life described in the remaining pages. The general accuracy is high. The illustrations are excellent and the photographs and color plates are not only original but good. The importance of conservation of natural conditions and life on accessible reef areas is stressed and the well rounded synoptic treatment of marine plants and both marine invertebrates and vertebrates should make the book a useful reference work for fishermen and adventurers as well as to those of us who merely wish that we had the time and energy to look under the sea for ourselves.

--Stewart Springer

MARYLAND:

Annual Report, 1954, by R. V. Truitt, Educational Series No. 39, 32 pp., illus., printed. (Reprinted from Eleventh Annual Report, Maryland Board of Natural Resources, 1954.) Chesapeake Biological Laboratory, Maryland Department of Research and Information, Solomons, Md., August 1955. Reports on Maryland's natural resources and includes discussions on oyster and clam investigations, fish and fisheries problems, crabs, marine borers, fish conservation projects, Chincoteague Bay studies, and hydrography.

Annual Report, 1955, by L. Eugene Cronin, 33 pp., illus., printed. (Reprinted from Twelfth Annual Report, Maryland Board of Natural Resources.) Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md., August 1956. Reports on Maryland's most important natural resources and primarily discusses shellfish, crabs, fish and fisheries, and hydrography of the Chesapeake Bay regions; Chincoteague Bay studies; and inland fish investigations.

MOLLUSKS:

Freshwater Mollusks of Alabama, Georgia, and Florida from the Escambia to the Suwannee River, by William J. Clench and Ruth D. Turner, Bulletin of Biological Sciences, vol. 1, no. 3, 1956, 239 pp., illus., printed, $1.80. University of Florida, State Museum, Gainesville, Fla.

NORWAY:

Konkylien (The Shell), vol. 1, no. 1, December 1956, 30 pp., illus., printed in Norwegian with summary in English. Stord Marin Industri A/S, Bergen, Norway. The first issue of a technical publication which will be published 3 or 4 times a year and will include news regarding fishing and the fish meal industries. It is intended to give up-to-date information about matters directly connected with the activities of the Stord

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Marin Industri A/S and S. Bartz-Johannessen and associated companies, together with news of production and sales of herring meal and oil, fish meal, solubles, and seaweed meal. There will be included details of new plants, the sale and deliveries of industrial equipment and apparatus, the planning of factory plants, etc., both in Norway and abroad. Summaries in English are given of the following articles: "The Rotadisc Steam-Heated Drier (Of Novel Construction and Greatly Reduced Dimensions);" "Tobis, a Raw Material for Fish Meal Plants;" and "Caplin, for Food and Industrial Purposes."

Norges Fiskerier, 1953 (Fishery Statistics of Norway), Norges Offisielle Statistikk Series XI, no. 237, 113 pp., illus., printed in Norwegian with foreword, table of contents, and summary in English. Director of Fisheries of Norway, Bergen, Norway, 1956. A detailed statistical report on the fisheries of Norway with discussions of the number of fishermen, craft, processing plants, gear; quantity and value of total landings; herring, sprat, cod, mackerel, tuna, dogfish, and caplin fisheries; fisheries in distant waters; and catch of small whales and sealing. Statistics are given on quantity, value, and average prices of all species of fish caught commercially. The following new tables have been included: trawl fishing in West Greenland waters; long-lining in West Greenland waters; Icelandic herring fisheries; participation, duration of trips and landings, by tonnage groups and type of fishing gear; landings from distant waters, by counties; and catch of fat and small herring by months for each county. Also contains a list of scientific and common names, in four different languages, of fish, crustaceans, mollusks, and other aquatic organisms in Norwegian waters; drawings of the principal species of fish, mollusks, and crustaceans; and drawings of the different types of fishing gear.

OREGON:

Oregon's Warm-Water Game Fish, Informational Leaflet No. 9, 4 pp., illus., printed. Department of Information and Education, Game Commission, Portland, Ore.

OYSTERS:

"Deterioration of Cooked Southern Oysters," by Elizabeth Ann Gardner and Betty M. Watts, article, Food Technology, vol. 11, no. 1, January 1957, pp. 6-11, printed, single copy: domestic, $1.50; foreign, $1.75. The Garrard Press, 119 West Park Ave., Champaign, Ill. Describes a study of the rate and type of spoilage which occurs in cooked oysters. Raw southern oysters were found to give an exceptionally strong qualitative test for the enzyme catalase with 3-percent hydrogen peroxide. This test was used to indicate inactivation of this enzyme by heat treatment. Spoilage which took place in oysters cooked enough to inactivate catalase and subsequently frozen or refrigerated appeared to be of an oxidative type, characterized by a rancid fish odor. By adding various antioxidants to the cooking water, this type of spoilage was retarded. Weight losses during cooking were influenced more by length of cooking time than by type of cooking method. Further losses of liquid took place upon refrigerated storage of the cooked oysters.

Distribution of Oyster Larvae and Spat in Relation to Some Environmental Factors in a Tidal Estuary, by Joseph H. Manning and H. H. Whaley, Contribution no. 105, 10 pp., illus., processed. (Reprinted from the Proceedings of the National Shellfisheries Association, vol. 45, August 1954, pp. 56-65.) Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

Oyster Culture in South Africa, by Dr. P. Korringa, Investigational Report No. 20, 86 pp., illus., printed. (Reprinted from Commerce and Industry, March 1956.) Department of Commerce and Industries, Division of Fisheries, Pretoria, Union of South Africa, 1956.

Various Aspects of Oyster Setting in Maryland, by G. Francis Beaven, Resource Study Report No. 8, 9 pp., illus., processed. (Reprinted from the Proceedings of the National Shellfisheries Association, vol. 45, August 1954, pp. 29-37.) Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

PAKISTAN:

Marine Fishes of Karachi and the Coasts of Sind and Makran, 80 pp., illus., printed. Government of Pakistan, Ministry of Food and Agriculture, Central Fisheries Department, Karachi, Pakistan, 1955.

PRESERVATION:

"Characteristics of Electron-Irradiated Meats Stored at Refrigerator Temperatures," by J. F. Kirn, W. M. Urbain, and H. J. Czarnecki, article, Food Technology, vol. 10, no. 12, December 1956, pp. 601-603, printed, single copy $1.50. (Published by the Institute of Food Technologists.) The Garrard Press, 119 West Park Ave., Champaign, Ill.

QUALITY:

"A Rapid Vacuum Distillation Procedure for the Determination of Volatile Acids and Volatile Bases in Fish Flesh," by Tetuo Tomiyama, Antonio A. da Costa, and Joseph A. Stern, article, Food Technology, vol. 10, no. 12, December 1956, pp. 614-617, illus., printed, single copy $1.50. (Published by the Institute of Food Technologists.) The Garrard Press, 119 West Park Ave., Champaign, Ill.

REFRIGERATION AND FREEZING:

"Zur Frage des Fischgefrierens auf See (The Problem of Freezing Fish at Sea)," by Dr. J. Kuprianoff, article, Kaltetechnik, vol. 8, no. 4, April 1956, pp. 114-121, illus., printed in German. Deutschen Kaltetechnischen Vereins, Karlsruhe, Germany. Surveys the economic aspects of the problem, quality of the fish when landed, current interest in freezing fish at sea, and operational experience gained by British, German, and Soviet freezing trawlers. The form in which fish is frozen has an essential bearing on the freezing procedure and type of refrigeration plant. Freezing of whole fish is simpler and does not involve much space or costly investment, but freezing of filleted fish is expensive since it involves additional operations such as sorting, washing, heading, filleting, and packaging. Fillets and

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steaks are frozen in metal molds but use of plastic sheets is recommended to prevent undesirable complications which may result from contact and sticking to the metal. Freezing fish at sea presents no fundamental technical difficulties and the problems are regarded as chiefly of an economic nature.

SEA LAMPREY:

"The Questionable Sea Lamprey," by Justin W. Leonard, article, Michigan Conservation, vol. XXVI, no. 1, January-February 1957, pp. 19-21, illus., printed. Michigan Department of Conservation, Lansing, Mich.

SALMON:

Aroostook River Salmon Restoration and Fisheries Management, by Kendall Warner, Fishery Research Bulletin No. 4, 66 pp., illus., printed. (Published jointly by Maine Department of Inland Fisheries and Game and Atlantic Salmon Commission.) Department of Inland Fisheries and Game, Augusta, Maine, 1956.

Babine River Salmon after Removal of the Rock Slide, by H. Godfrey, W. R. Hourston, and F. C. Withler, printed, 50 cents. Fisheries Research Board of Canada, Ottawa, Canada.

Conference on Pink Salmon of the Fraser River Area Between the United States of America and Canada (Proceedings of Plenary Sessions and Precis of Committee Meetings), 70 pp., processed. Conference on Pink Salmon of the Fraser River Area, Room 118, House of Commons, Ottawa, Canada, October 22-25, 1956.

King Salmon and the Ocean Troll Fishery of Southeastern Alaska, by Robert A. Parker and Walter Kirkness, Research Report No. 1, printed. Alaska Department of Fisheries, Juneau, Alaska. Gives the statistical history of the troll salmon catch in Southeastern Alaska.

Machias River Salmon Restoration, by James S. Fletcher, 25 pp., illus., printed. Atlantic Salmon Commission, Augusta, Maine, 1955.

SEA SCALLOP:

The Maine Sea Scallop Fishery, by Robert L. Dow, Fisheries Circular 19, 9 pp., illus., processed. Department of Sea and Shore Fisheries, State House, Augusta, Maine, December 1956. The sea scallop, Pecten magellanicus, is Maine's fifth most valuable fishery. This paper discusses the commercial history of the sea scallop fishery and includes statistics on the production and value of the fishery for the period 1942-55. Also describes biological research, management recommendations, offshore fishery, winter fishery, extent of inshore scallop fishing operations, fishing efficiency, demand and abundance, mortalities, and future development of the inshore fishery.

SEAWEED:

Seaweed Prospects, 30 pp., illus., printed. Institute of Seaweed Research, Inveresk, Midlothian, Scotland, March 1956. Describes the commercial exploitation and use of seaweed in the chemical, pharmaceutical, textile, food, and fertilizer industries. A summary of the Institute's technical findings, which should be of value to firms engaged or interested in seaweed utilization, covers the supply position of brown seaweed and red seaweed, development of harvesting machinery, value of seaweed in animal feedstuffs and as fertilizer in the soil, seaweed chemicals, and the development of commercial outlets for seaweed and seaweed chemicals. Data sheets are appended which give summarized details of the preparation, properties, derivatives, and uses of ascophyllum meal, laminaria meal, alginic acid and the alginates, d-mannitol, laminarin, fucoidin, fucosterol, agar, and carrageenin.

SHRIMP:

"Chemical Ices for Shrimp Preservation," by E. A. Fieger, M. E. Bailey, and A. F. Novak; and "Factors Influencing the Sporadic Development of Discoloration in Canned Wet Pack Shrimp," by R. G. Landgraf, Jr., articles, Food Technology, vol. 10, no. 12, December 1956, pp. 578-583 and 607-610, respectively, illus., printed, single copy $1.50. (Published by the Institute of Food Technologists.) The Garrard Press, 119 West Park Ave., Champaign, Ill.

SOUTH CAROLINA:

Annual Report, 1955-1956, Contribution No. 24, 19 pp., illus., printed. (Reprinted from Report of South Carolina Wildlife Resources Department, Fiscal Year July 1, 1955-June 30, 1956.) Bears Bluff Laboratories, Wadmalaw Island, S. C., January 1957. A detailed description of the activities of Bears Bluff Laboratories for the period under review, covering the study of oysters, shrimp, crabs, finfish, and salt-water ponds. Also describes offshore explorations with Bears Bluff's deep-sea research vessel, the 65-foot T-19.

STRIPED BASS:

Recaptures of Tagged Striped Bass, ROCCUS Saxatilis (Walbaum), Caught in Deep Water of Chesapeake Bay, Maryland, by Romeo Mansueti, Resource Study Report No. 10, 9 pp., illus., processed, October 1956. Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

SWEDEN:

Swedish Investigations on Ling (MOLVA VULGARIS Fleming), by Arvid R. Molander, Series Biology, Report No. 6, 39 pp., illus., printed. Institute of Marine Research, Fishery Board of Sweden, Lysekil, Sweden, 1956.

TAGGING:

Notes on Marking Live Fish with Biological Stains, by Arnold Dunn and Coit M. Coker, Contribution no. 86, 4 pp., illus., printed. (Reprinted from Copeia, no. 1, March 21, 1951, pp. 28-31.) Chesapeake Biological Laboratory, Maryland Department of Research and Education, Solomons, Md.

TENNESSEE VALLEY AUTHORITY:

Annual Report for 1956 (A Record of Activities and Accomplishments for the Fiscal Year Ending June 30, 1956), Report No. 216-56, 56 pp., illus., processed. Division of Forestry Relations, Tennessee Valley Authority, Norris, Tenn. Includes,

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among others, a chapter on fish and game investigations which describes fish population studies, fish creel census, harvesting studies, the Norris Reservoir netting study, fish stocking in TVA reservoirs, commercial fishing, and the mussel industry. Statistics are also presented on the quantity and value of the commercial species of fish taken in the Guntersville, Wheeler, Wilson, and Pickwick Reservoirs, and the mussel shell harvest of the Lower Mainstream Reservoirs.

TROUT:

An Evaluation of Massachusetts' Trout Stream Fishery, by James W. Mullan, 11 pp., processed. Division of Fisheries and Game, Upton, Mass.

TURKEY:

"Turk Balikci Tekneleri" (On the Turkish Fishing Boats), by H. I. Chapelle and M. N. Ozerdem, article, Balik ve Balikcilik (Fish and Fishery), vol. V, no. 1, January 1957, pp. 14-18, illus., printed in Turkish. Et ve Balik Kurumu, Istanbul, Turkey.

UNTED KINGDOM:

Herring Industry Accounts, 1955-56, 7 pp., printed. Her Majesty's Stationery Office, London, England. Shows the sums received and paid out of the Herring Marketing Fund for the purpose of making loans in connection with export, or for undertaking operations involving the outlay of working capital (chiefly in connection with the Herring Industry Board's herring meal and oil schemes). Also shows receipts from repayments of the principal of such advances, and receipts and advances connected with the acquisition of new fishing vessels and of new engines for vessels belonging to working fishermen. Advances from the Fund during the year ended March 31, 1956, were to provide working capital. No advances were made during the year in respect to schemes connected with export. Loans connected with export made in earlier years have been repaid in full.

Sea Fisheries, Their Investigation in the United Kingdom, edited by Michael Graham, 487 pp., illus., printed. Edward Arnold (Publishers) Ltd., London, England, 1956. A generously illustrated book that discusses past and present main findings of fisheries laboratories in the United Kingdom. Presents detailed reports on the following subjects: origin of fishery science in the United Kingdom; general knowledge of demersal and pelagic fisheries of the United Kingdom and development of fishery statistics; plankton; benthos and shellfish; the pelagic phase; biology, fishery, and economic importance of cod, haddock, hake, and plaice; and the theory of fishing. Also has an excellent bibliography.

VESSELS:

"Operations of Modern Fishing Craft," article, Trade News, vol. 9, no. 5, November 1956, pp. 3-7, illus., printed. Director of Information and Educational Service, Department of Fisheries, Ottawa, Canada. Reviews the 1955 report of a study conducted by the Department of Fisheries of Canada on the economics of modern fishing-craft operations in the Atlantic Coast area. Includes tables and excerpts from the report's summary of analysis of findings; descriptive material with respect to fishing boats; gear, and operational methods; categories of capital cost; problems of financing and related topics; and details of 1955 accounts.

VIRGINIA:

(Commission of Game and Inland Fisheries) Annual Report for the Fiscal Year Ending June 30, 1955, 41 pp., printed. Division of Purchase and Print, Commission of Game and Inland Fisheries, Richmond, Va., 1956.

YEARBOOKS AND DIRECTORIES:

Fisheries Yearbook and Directory, 1956, edited by Harry F. Tysser, 462 pp., illus., printed. British-Continental Trade Press Ltd., 222 Strand St., London W.C. 2, England. An international reference book and directory of the fishing and fish-processing industries. It covers the world's fish catches, curing, canning, quick-freezing, consumption, imports and exports, technological progress, and other items of importance. The book contains two parts, the first of which is composed of the following articles: "The British Fishing Industry;" "English Fishery Research in 1955," by Michael Graham; "Denmark's Fishing Industry," by Chr. Christiansen; "The Fishing Industry of the Federal Republic of Germany," by Dr. G. Meseck; "Around the World," a report on the fishing industries and fishery activities of Argentina, Australia, Belgium, Canada, Formosa, East Zone of Germany, Japan, Netherlands, Norway, Poland, South Africa, United States, U.S.S.R., and Yugoslavia; "Preservation of Fish," by K. Beck-Slinn; "Fish Processing Equipment;" "Practical Guide to Fish Products and Treatment," by Eric Hardy; "How to Plan a Fish Meal Plant," by Olaf Braten; "Organization and Trade Associations;" "Trade Journals of Interest to the Fishing Industry;" "Fish Suppliers Calendar;" "Dictionary of Fish Names;" "Fishing Vessel Construction and Equipment;" "Recent Shipbuilding and Engineering Developments;" "Progress in Quick-Freezing;" and "Icelandic Fisheries and Exports." The second part of the book is a directory section which contains the following ten parts: (1) exporters, curers, quick-freezers, trawler owners; (2) importers and wholesalers; (3) fish canners and preservers; (4) machinery and equipment for fish processing and refrigeration; (5) packing machinery, materials, etc.; (6) supplies for fisheries; (7) fishery byproducts; (8) cold-storage and transport; (9) list of trade marks and names; and (10) buyer's guide and classified list of advertisers. The wide scope and detailed subject matter covered make this book valuable as a guide to the world's fisheries.

Statistical Year Book, 1956, International Tin Study Group, 284 pp., printed, $5.60. International Tin Study Group, 7 Carel van Bylandtlaan, The Hague, Netherlands. A yearbook presenting statistics and general reports of the tin-producing and tin-consuming industries of the world. The book has two parts, the first of which deals with tin and tinplate. The second part of the book deals with the canning industry and presents, among others, a brief report of production of canned fish by countries throughout the world.

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The second part also contains sections on Africa, North America, Central America, and the West Indies, South America, Asia, Europe, and Oceania, and presents, among other products, detailed reports and statistics of fish canning for each general area and each country within the areas.

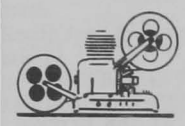
WASHINGTON:

Washington State Department of Fisheries, 65th Annual Report, 1955, 64 pp., illus., printed. Washington State Department of Fisheries, Seattle, Wash., December 1956. Discusses the activities and objectives of the Department of Fisheries for the year 1955, with a review of fisheries progress. The Department's program of research and management of marine fish and shellfish is discussed in considerable detail and covers research at power dams, salmon culture, marine and stream research, shellfish research, the salmon fishery, stream improvement and salmon restoration, and cooperative research and management programs. Also includes sections on fisheries patrol, legislation, fisheries news log, 1955 regulation changes, escapement counts of sockeye and silver salmon at Baker River Dam, and White River escapement counts of silver and chinook salmon at Mud Mountain trap.

WHALES:

The Scientific Reports of the Whales Research Institute, No. 11, 218 pp., illus., printed, June 1956. The Whales Research Institute, No. 4, 12 Chome, Nishigashidori Tsukishima, Chuo-ku, Tokyo, Japan.

FISHERY MOTION PICTURE



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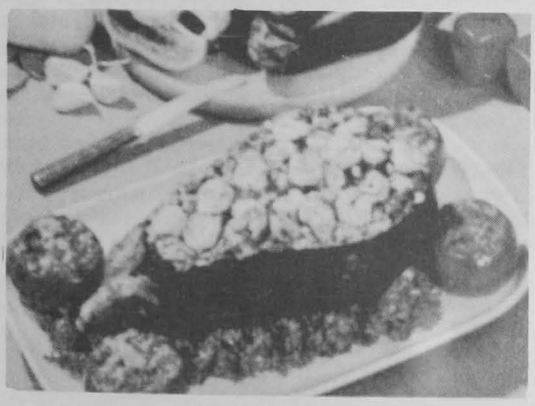

SHRIMP STUFFED EGGPLANT

Shrimp Tips from New Orleans, a 16 mm. color film, produced and distributed by the U. S. Fish and Wildlife Service, especially designed for color or black-and-white television use, in which time-tested shrimp recipes are featured. The film, with its New Orleans setting, authentically portrays the culture, architecture, art, and music of that famous city, the strains of French cafe and modern Dixieland music lending additional atmosphere to the scenes. Preparation and serving of six recipes is woven colorfully into the 14-minute film. To borrow this film or obtain information about the sale of prints, write to the U. S. Fish and Wildlife Service, Washington 25, D. C.

Editorial Assistant--Ruth V. Keefe Illustrator--Gustaf T. Sundstrom

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FISH AND WILDLIFE SERVICE HATCHERIES INCREASE TROUT PRODUCTION

Research and improved management techniques are paying big dividends in the production of trout at U. S. Fish and Wildlife Service hatcheries.

The 1955 output at all Fish and Wildlife Service hatcheries producing trout was 1,244,000 pounds, compared with 473,000 pounds in 1951. The Service operates 24 hatcheries which produce trout only and another 19 at which some trout are produced in addition to either salmon or warm-water fish. There are additional hatcheries for salmon only and others for warm-water fish only.

While some of the increase in trout poundage is due to enlarged facilities, rigid application of improved hatchery management techniques developed by research is the principal contributing factor. These research findings include knowledge of trout metabolism and improved diet and feeding practices developed at Fish and Wildlife Service laboratories. The full utilization of rearing space and the development and use of improved hatchery equipment also have been responsible for some of the gains.

FIG. 1 - WARM WATER HATCHERY, HEBRON, OHIO.

At one hatchery there were two other factors which contributed to the tremendous increase in poundage. One of these is a heater which holds the hatchery water at the proper temperature during the winter months and makes it possible to transfer fingerlings instead of fry to the rearing ponds and lakes in the spring. The other is the utilization of the small natural lakes for rearing.

Heating units are now installed in two other hatcheries. The first such Fish and Wildlife Service project for artificially warming the hatchery water was at Spearfish, S. Dak. One of the objectives of trout propagation is to have the fish well into the fingerling stage by the time they are taken from the hatchery and placed in the rearing ponds. This gives them a chance to develop rapidly during the summer months, when water temperature is most suitable for rapid growth.

Trout eggs hatch and the young fish grow best in water between 50° and 60° F. The rule of thumb in trout propagation in relation to hatching time is "50 days at 50 degrees." In colder waters the hatching time is extended considerably.

Only a few years ago it was hoped that the average hatchery could produce one pound of trout per cubic foot of water. Now many Service hatcheries produce from 2 to 6 pounds per cubic foot of water. Some years ago it took 5 pounds of feed to produce a pound of trout. Now it takes 3.5 pounds, and in some instances less to produce a pound of trout. Per-man-production now may be as high as 15,000 or 18,000 pounds in one year at individual hatcheries, considerably higher than it was some years ago, but the average is about one-third of this.

FIG. 2 - TROUT PONDS AND HATCHERY BUILDINGS AT FISH CULTURAL STATION. THE PONDS ARE BEING CLEANED.

Larger hatcheries have proved to be more efficient than smaller ones. Many factors control the size of the hatchery, most important of which is the quality and quantity of the available water supply. While 50-degree water is ideal for trout hatching, the spawners do better in water somewhat cooler than that.

Trout hatcheries may be equipped with troughs or tanks for hatching and early rearing, and either ponds, concrete raceways, or small lakes for summer growth. Cold-storage space for about one-half of the year's supply of meats and other perishables and a fish-food preparation room equipped with proper slicers, grinders, and mixers are all part of a well-established hatchery.