



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 - STATISTICAL SECTION 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-1617 | - Texas Landings, June 1957, 3 pp. |
| CFS-1624 | - Fish Meal and Oil, July 1957, 2 pp. |
| CFS-1630 | - Mississippi Landings, 1956 Annual Summary, 3 pp. |
| CFS-1633 | - Texas Landings, July 1957, 3 pp. |
| CFS-1636 | - New Jersey Landings, July 1957, 4 pp. |
| CFS-1638 | - Ohio Landings, August 1957, 2 pp. |
| CFS-1639 | - North Carolina Landings, August 1957, 3 pp. |
| CFS-1640 | - Florida Landings, July 1957, 6 pp. |
| CFS-1641 | - Texas Landings, August 1957, 3 pp. |
| CFS-1642 | - Shrimp Landings, June 1957, 6 pp. |
| CFS-1644 | - South Carolina Landings, August 1957, 2 pp. |
| CFS-1645 | - Georgia Landings, August 1957, 2 pp. |
| CFS-1647 | - Alabama Landings, August 1957, 2 pp. |
| CFS-1650 | - Rhode Island Landings, July 1957, 3 pp. |
| CFS-1651 | - New Jersey Landings, August 1957, 3 pp. |
| CFS-1652 | - Massachusetts Landings, April 1957, 4 pp. |
| CFS-1654 | - Rhode Island Landings, August 1957, 3 pp. |
| CFS-1655 | - Maine Landings, August 1957, 3 pp. |
| FL-441 | - The Lake Trout (<u>Salvelinus namaycush</u>), by Paul H. Eschmeyer, 11 pp., illus., August 1957. Provides a brief description of the lake trout and discusses the following aspects of its life history: geographic distribution, habitat, reproduction, the young, age and growth, food, and movement. Also reports on artificial propagation, lake trout fisheries, and the lake trout and the sea lamprey in the Great Lakes. |
| FL-442 | - Sea Scallop Boats and Gear, by J. A. Posgay, 12 pp., illus., August 1957. Presents a brief and general discussion of the sea scallop fishery off the North Atlantic coast. Reports on the types of vessels and gear used and shows--with the aid of a diagram and eight photographs--most of the details of construction and handling of the 11-foot dredge which is now fairly standard in the New Bedford (Mass.) fleet. |

- Wholesale Dealers in Fishery Products (Revised):
 SL-4 - Rhode Island, 1957.
 SL-6 - New York Coastal Area, 1956.
 SL-7 - New Jersey, 1957.
 SL-8 - Pennsylvania, 1957.
 SL-9 - Delaware, 1957.
 SL-36 - Iowa, 1957.
 SL-37 - Kansas, 1957.
 SL-42 - Kentucky, 1957.
 SL-44 - Nebraska, 1957.

SSR-Fish. No. 189 - Fluctuations in Abundance of Columbia River Chinook Salmon, 1928-54, by Harold A. Gangmark, 25 pp., illus., July 1957.

SSR-Fish. No. 205 - Experimental Fishing to Determine Distribution of Salmon in the North Pacific Ocean, 1955, by Donald E. Powell and Alvin E. Peterson, 35 pp., illus., July 1957. Distribution of salmon on the high seas in the North Pacific Ocean was investigated during the summer and early fall of 1955. Three vessels conducted extensive gill-net operations over a 3½-month period in the Gulf of Alaska and in the offshore waters south of the Aleutian Islands and the Alaska Peninsula, with a limited amount of fishing off the coasts of Oregon, Wash., and British Columbia. Results showed that the several species of North American salmon and the steelhead trout were widely distributed in the open ocean at that time of year and could be sampled readily with surface gill nets. Salmon were caught at all stations occupied from off northern Vancouver Island across the Gulf of Alaska as far west as Unalaska Island. Catches farther west and in more southerly waters revealed an apparent southern limit for high-seas salmon at about 47° N. latitude in the area of major operation. South of this line in the warmer waters albacore replaced salmon in the gill-net catches. Length measurements of all salmon were taken aboard the vessels and are presented graphically according to species and by mesh size.

SSR-Fish. No. 208 - Contributions to the Study of Subpopulations of Fishes, coordinated by John C. Marr, 132 pp., illus., April 1957. A collection of papers representative of the studies now being made of subpopulations of fishes. The papers included are: "The Problem of Defining and Recognizing Subpopulations of Fishes," by John C. Marr; "Statistical Comparison of Morphological Data," by William F. Royce; "Measurement of population Movement by Observation of Meristic or Morphometric Characters," by T. M. Widrig and Bruce A. Taft; "A Review of Paper Chromatography as Used in Systematics," by David A. Farris; "The Use of Immunological Techniques in Racial Studies," by George J. Ridgway; "A Review of Recent Studies of Subpopulations

of Pacific Fishes," by Elbert H. Ahlstrom; "Races of Cutthroat Trout in Yellowstone Lake," by Oliver B. Cope; "Populations of the Striped Bass, *Roccus saxatilis* (Walbaum) in Tributaries of Chesapeake Bay," by Edward C. Raney; "The Subpopulation Problem in the Pacific Sardine, *Sardinops caerulea*," by John C. Marr; "Disease Resistant and Susceptible Populations of Brook Trout (*Salvelinus fontinalis*)," by S. F. Snieszko; and "Note on the Subpopulations of Lake Trout in the Great Lakes," by Paul H. Eschmeyer.

SSR-Fish. No. 209 - Guide to Literature on Systematic Biology of Pacific Salmon, by Norman J. Wilimovsky and Warren O. Freihofer, 274 pp., April 1957.

SSR-Fish. No. 222 - Survey of the Ocean Fisheries off Delaware Bay, by Fred C. June and John W. Reintjes, 60 pp., illus., August 1957. A survey of the ocean fisheries in the region lying between Barnegat and Winter Quarter lightships has furnished detailed information on the fisheries and important fish stocks within the area. Menhaden, otter-trawl, and surf-clam fisheries account for 98 percent of total production. Miscellaneous minor fisheries include purse seine for food fish, pot, pound net, drift gill net, trawl line, hand line, troll line, scallop dredge, and sport. The sport or recreational fishery is included among the minor fisheries on the basis of estimated production. An economic evaluation would place it among the three major fisheries, however. Analyses were made of the menhaden purse-seine fishery from 1939-1953, the surf-clam fishery from 1950-1953, and for all other fisheries from 1946-1953. Field data collected for 1952-1953 from dock and plant records and fishing logbooks give information on catch-per-unit-effort and fishing effort for all the major fisheries, fishing grounds, and seasons for all fisheries.

SSR-Fish. No. 223 - The Response of Tuna and Other Fish to Electrical Stimuli, by Iwao Miyake and Walter R. Steiger, 28 pp., illus., June 1957. Describes a study concerned with some of the technical problems involved in electro-fishing in sea water and particularly with the power requirements necessary to elicit electro-taxis in tuna. It includes theoretical studies on the distribution of the electric field in a highly conductive medium such as sea water and on the internal and external fields affecting a fish. It also includes preliminary studies on a small marine fish, the wholehole, or mountain bass (*Kuhlia sandvicensis*), to determine optimum values of current density, pulse duration, and pulse frequency for electro-taxis in a small tank. It describes an apparatus designed to produce electro-taxis in tuna in a large tank and provides the results of experiments which show that tuna exhibit the electro-tactic response. Finally, it includes a discussion of the power requirements in the open sea as compared with those in a small tank.

SSR-Fish. No. 224 - Sardine Eggs and Larvae and Other Fish Larvae, Pacific Coast, 1955, by Elbert H. Ahlstrom and David Kramer, 93 pp., illus., July 1957.

SSR-Fish. No. 230 - Oceanographic and Meteorological Observations in the Northeast and Cen-

tral North Pacific, July-December 1956, by Richard J. Callaway, 54 pp., illus., August 1957.

SSR-Fish. No. 235 - Survey of Shrimp Fisheries of Central and South America, by Milton J. Lindner, 171 pp., illus., November 1957. This report is primarily an examination of the potentialities of the shrimp fisheries of Latin America as a source of supply for the United States market. For each country, detailed data are given on commercial species and fishing grounds, on outlook for production, on fishermen and gear, on processing and marketing, on foreign trade, and on governmental assistance. The same sequence of presentation is followed, as far as possible, for each country. The survey conducted by the author indicates that there are vast stretches of coast along continental Latin America where the shrimp populations are very sparse or are concentrated in patches in widely scattered areas. For some countries the production outlook is favorable and the prospect for the development of the fishery is discussed in relation to the availability of commercial species on the fishing grounds, processing and marketing costs, and the effect of government regulations and controls. In the case of Mexico, the chief source of shrimp imports into the United States, the fishery appears to have reached the stage where productive ability no longer depends upon fishing or plant capacity but more upon the biological potential of the species of shrimp and the capacity of the market to absorb smaller-sized shrimp. There are at least 21 species of marine and brackish-water shrimp that are of commercial importance in continental Latin America. However, 10 species of shrimp belonging to the genus *Penaeus* comprise the bulk of the shrimp fishery, accounting for about 90 percent of the total catch.

Annual Report of the Woods Hole Laboratory for the Year Ending June 30, 1957, 70 pp., illus., processed. This report, constituting part of the annual report of the Branch of Fishery Biology, presents a summary of research activities in the North Atlantic Fishery Investigations program and a description of the vessels and shore facilities. It also contains project reports on bottom ecology, cod, flounders, haddock, industrial fishery, plankton ecology, population dynamics, port sampling, ocean perch (redfish), sea scallops, whiting, Atlantic herring investigation, and Passamaquoddy investigations.

Sep. No. 493 - Effects of Temperature Upon the Storage Life of Fresh Shucked Pacific Oysters (*Ostrea gigas*).

Sep. No. 494 - A Review of the Soupfin Shark Fishery of the Pacific Coast.

Sep. No. 495 - Research in Service Laboratories (December 1957): Contains these articles--"Research Developing Ways to Assure Boneless Fish Products;" "Utilizing the Unique Properties of Fish Oils;" "Keeping Quality and Rate of Freezing of Cooked Lobster Meat;" "Technical Note No. 41 - Bacterial Studies of Frozen Raw Breaded Shrimp;" and "Studies on the Free Liquor, Salt, and Dry Solids Relationships of Oysters Continued."

Sep. No. 496 - Utilization of Fish Waste in Northern Oregon for Mink Feed.

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

Boston Fishery Products Monthly Summary, September 1957; October 1957; 15 pp., each. (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.

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

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, September 1957, 14 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces; fresh-water fish, shrimp, and frozen fillet wholesale market prices; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, September 1957 and October 1957, 5 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; and wholesale prices of fish and shellfish on the New Orleans French Market; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, October 1957, 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, Ocean City, and Cambridge; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

(New York) Monthly Summary - May 1957 - Receipts of Fishery Products at the New York City Wholesale Salt-Water Market, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Receipts in the salt-water section of the Fulton Fish Market by species and by states and provinces; for the month indicated.

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

How to Cook Tuna, by Kathryn L. Osterhaug, Paula J. Wieters, and Rose G. Kerr, Test Kitchen Series No. 12, 16 pp., illus., printed, 20 cents,

1957. Contains 41 choice recipes for preparing canned tuna. Several varieties of tuna--all equally desirable--are available to the homemaker. On the Pacific Coast the catch includes albacore, bluefin, skipjack, and yellowfin, while bluefin and little tuna are taken on the Atlantic Coast. Albacore has lighter meat than the other species and is the only tuna permitted to be labeled as "white meat". The other varieties are labeled as "light meat" tuna. This is No. 12 in the Test Kitchen Series of fish-cookery publications.

Shad Fishery of Chesapeake Bay with Special Emphasis on the Fishery of Virginia, by Charles H. Walburg and James E. Sykes, Research Report 48, 29 pp., illus., printed, 1957, 20 cents. The catch of shad along the Atlantic Coast has declined seriously since the turn of the century. Because of this decline, a study was made of the coastal shad fisheries to (1) determine factors causing decline, (2) determine conditions favoring recovery, and (3) provide basic information for scientific management so that each fishery may be managed to obtain an optimum sustained yield. This paper gives the results of the Chesapeake Bay investigation in 1952, with special emphasis on the Virginia shad fishery including that of the Potomac River. The purpose of this study was to estimate fishing effort, fishing rate, catch, size of run, and spawning escapement for Chesapeake Bay and each of its major tributaries in 1952, and for every other year in which catch and effort data were available.

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:

"Freezing and Drying in Intertidal Algae," by John Kanwisher, article, The Biological Bulletin, vol. 113, no. 2, October 1957, pp. 275-285, illus., printed, single copy \$2.50. The Biological Bulletin, Marine Biological Laboratory, Wood Hole, Mass.

BIBLIOGRAPHIES:

A World Periodicals List for Fisheries Science (1st draft - May 10, 1957), 89 pp., processed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1957.

CANADA:

The Commercial Fisheries of Canada, 197 pp., illus., printed. The Department of Fisheries of Canada, Ottawa, Canada, September 1956. Contains an excellent historical review of Canada's commercial fisheries from the beginning of the 16th century through 1955. The chapter on resources covers the most important species of commercial fish--groundfish, halibut, salmon, herring, lobsters, miscellaneous sea fish, and fresh-water fish. Other chapters contain data on methods of preservation of fish, marketing

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

and prices, the future demand for fishery products, and the prospects for development. In addition, there is a map showing the location of the principal sea and inland fisheries; a list of the principal species of fish in Canadian coastal and inland waters, with their common and scientific names; and statistical data on production, consumption, prices, and imports and exports.

Journal of the Fisheries Research Board of Canada, vol. 14, no. 5, September 1957, 126 pp., illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains, among others, the following articles: "Some Considerations of Population Dynamics and Economics in Relation to the Management of the Commercial Marine Fisheries," by Milner B. Schaefer; "The Optimum Level of Fisheries Exploitation," by Harold C. Frick; "Squid, *Illex illecebrosus* (Le Sueur), in the Newfoundland Fishing Area," by H. J. Squires; and "The Action of Pseudomonas on Fish Muscle: 2. Musty and Potato-Like Odours," by C. H. Castell, Maxine F. Greenough, and Norma L. Jenkin.

Maritime Fisheries Statistics, 1954-1955, 63 pp., printed. Quebec Bureau of Statistics, Department of Trade and Commerce, Quebec, Canada, 1957. Statistics of the Province of Quebec's maritime fisheries are issued for the first time as a separate publication. Statistics for the years prior to 1954 were published in the annual report of the Canadian Department of Fisheries; various numerical data still appear in that report as well as in the Province's Statistical Year Book although in a summary and different form. The present booklet gives more detailed information and is intended for the use of professors, those engaged in research, and specialists. The first part provides an accurate description of the 28 districts or fishing centers of the Province. The two other parts contain statistics for 1954 and 1955; the first, on the quantities of fish caught and their value; the second, on the labor force and equipment.

Operations of Modern Long-Liners and Draggers, Atlantic Seaboard, 1952-1956, by John Proskie, Primary Industry Studies No. 1, vol. 6, Part 1, 84 pp., 1 map, processed; and Part 2, 67 pp., illus., processed. Department of Fisheries of Canada, Ottawa, Canada, 1957. This is the sixth in a series of annual reports on the study of the operations of modern fishing craft on the Atlantic seaboard. A review of the results of the study for the 1952-1956 period is presented in this report in two parts. Part 1 contains a brief analysis of the trends established over the five-year period that the study has been in progress, including the costs of vessel construction and equipment, fishing performance and productivity, returns on investment and the income of fishermen, and the size and design of fishing craft. Part 2 contains detailed summary of 108 boat accounts for the 1956 season. The tables contain a detailed comparison of results for the various types and size-classes of fishing craft. The data include capital and operating costs, returns to management and labor, and other

relevant financial information. Fishing performance and rate of output are also included. Reference is made here and there in the report to certain market factors, such as price levels and the extent of sales outlets, which, like production costs and the other economic phenomena detailed here, are of great significance for the fleet modernization program.

Progress Reports of the Pacific Coast Stations, No. 108, 31 pp., illus., printed. Fisheries Research Board of Canada, Technological Station, 898 Richards St., Vancouver 2, B. C., Canada. Contains, among others, the following articles: "Application of Refrigerated Sea-Water Fish Holding to a Halibut Fishing Vessel," by J.S.N. Harrison and S. W. Roach; "Control of Rancidity in Stored Fish, V.," by J. W. Boyd, P. J. Schmidt, D. R. Idler, and H. L. A. Tarr; and "The Nutritive Value of Fish Meal and Condensed Fish Solubles. XI. The Protein Nutritive Value of Fish Meals of Low and Normal Fat Content," by B. E. March, Jacob Biely, and H. L. A. Tarr.

COD:

"Method of Filleting Cod and Yield of the Production in an Annual Cycle," by W. Cieglewicz and E. Kordyl, article, Prace Morsk. Inst. Ryback, Gdyni No. 7, 1954, pp. 191-208, printed. (Abstracted in Food Science Abstracts, vol. 28, December 1956, p. 572.) Food Science Abstracts, Department of Industrial and Scientific Research, Post Office 569, London S.E. 1, England. Describes a method elaborated for filleting cod and discusses the yield from the raw material, assessed in relation to sex and to gonadal development in the annual cycle. Reports on the average annual yield of both sexes after evisceration and heading and on the best period for filleting.

A Selected Bibliography of Salt Cod, compiled by Marjorie E. McPhail, New Series Circular No. 5, 34 pp., processed. Fisheries Research Board of Canada, Technological Station, Halifax, Nova Scotia, June 1957. A bibliography of selected references on salt cod in five parts: (1) salt; (2) mechanism of salting; (3) spoilage and preservation; (4) processing; and (5) the salt cod industry.

COMMISSIONS:

(International North Pacific Fisheries Commission) Annual Report for the Year 1956, 93 pp., illus., printed. International North Pacific Fisheries Commission, 209 Wesbrook Bldg., University of British Columbia, Vancouver 8, B. C., Canada, 1957. This is the third 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 contains a report on the 1956 annual meeting, a report on administrative activities during the year, and summaries of the research carried out in 1956 under the Commission's program and coordination by the various cooperating research organizations in the three nations. The research program undertaken in 1956 was essentially an expansion and refinement of the broad investigations begun in 1955. Greatest attention was given to the

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

problem specified in the Protocol to the Convention, which requires the Commission to determine if salmon originating in the streams of Asia mingle in the sea with salmon originating in the streams of North America. Studies of the king crab stocks of the eastern Bering Sea were continued by vessels of the United States and Japan in a joint program. In 1956 work undertaken by Canada was continued and extended on projects under way in 1955, including a study of the skeletal anatomy of salmon; an attempt to find parasites which will indicate the origin of salmon occurring on the high seas; tagging of small sockeye, pink, and chum salmon to indicate migrations away from rivers of origin and the fisheries to which various stocks contribute; and cooperation in a study of the oceanographic background for salmon distribution. Work was initiated in 1956 on two additional items undertaken by Canada at the meeting of the Commission at Tokyo, October-November 1955, namely, participation in high-seas fishing to sample salmon and in studies of scales to discover characteristics by which stocks of various origins may be distinguished. Japan's interim report presents the results of compilations and studies up to the present time based on data obtained from the commercial catches and other materials collected by the salmon-fishing motherships, which operated in the North Pacific and its adjacent areas from early May to early August 1956, and also on data collected by three government research vessels which conducted investigations during the same period. Japanese king crab research in the eastern Bering Sea in 1956 under the Commission's program was conducted by a research worker aboard the crab-fishing mothership. The United States report discusses the offshore distribution of salmon, identification of stocks, study of movements by tagging, and oceanography. The field work of the king crab investigation was undertaken for the purpose of releasing tagged crabs, determining the distribution on the grounds, observing the condition of the crabs with respect to the moulting cycle, and determining the damage to female and undersized crabs as the result of otter trawling.

CONSUMPTION:

Fish Consumption--Where is it Headed? by A. W. Anderson, 5 pp., printed. (Reprinted from Proceedings of the Gulf and Caribbean Fisheries Institute, Ninth Annual Session, November 1956, pp. 88-92.) The Marine Laboratory, University of Miami, Coral Gables, Fla.

DEHYDRATION:

"Freeze-Dried Foods: What They Are--How They Are Prepared," by Earl W. Flosdorf, article, Frosted Food Field, vol. 24, June 1957, p. 15, printed. Frosted Food Field, 25 West Broadway, New York 7, N. Y. Describes a method of dehydrating foods by placing frozen foods in a vacuum dryer with means for heating. This method--technically known as vacuum sublimation--permits solid ice to pass directly to the vapor state without passing through the liquid-water state. The dehydration accomplished by this method produces dehydrated foods that are satisfactory to the palate.

DIRECTORIES:

The Conservation Directory (A Listing of Organizations and Officials Concerned with the Protection of Wildlife and Other Natural Resources), compiled by Stewart M. Brandborg and James S. Pacy, 102 pp., printed, 50 cents. National Wildlife Federation, 232 Carroll St., N. W., Washington 12, D. C., July 1, 1957. This booklet is designed to be a handy reference to conservationists, within government agencies and private organizations, by providing a list of the public agencies of national, state, and territorial governments of the United States and neighboring nations, and of nongovernment organizations within the United States which have a national or statewide scope of interest. Agencies of the state governments are listed, followed by an alphabetical listing of the citizen group.

ELECTRICAL FISHING:

"Die Anwendung des Impulsstromes in der Elektrofischerei" (Use of Impulse Current in Electrical Fisheries), by E. Halsband, article, Fischwirt, vol. 6, no. 6, June 1956, pp. 155-159, illus., printed in German. Deutscher Fischerei-Verband, Neuer Wall 72, Hamburg 36, W. Germany. Describes new equipment that can be connected to any existing electric gear which permits the use of interrupted current and yields a greater effect on fish to be caught.

"Die Beziehung Zwischen Intensitat und Zeitdauer des Reizes bei der Elektrischen Durchstromung von Fischen" (Relation Between Intensity and Impulse Duration of Electric Current Flow through Fish), article, Archiv fur Fischereiwissenschaft, vol. 7, no. 1, 1956, 8 pp., printed in German with English summary. Gustav Wenzel und Sohn, Braunschweig, W. Germany. Describes studies to determine the most effective impulse durations for achieving certain reactions in various types of fish.

"Fischfang mit Elektrizitat" (Fish Catching with Electricity), article, Deutsche Fischerei Zeitung, no. 11, November 1956, p. 352, illus., printed in German. Neumann Verlag, Radebeul/Dresden, E. Germany. By using the principle that fish in an electric field set up by direct current equipment tend to move towards the positive pole, Russian fishermen in the Far East attach a suction head and fish conveying pump to the positive pole and are thus able to catch fish and pump them aboard ship without the use of nets. It is reputed that 1,000 tons of salmon are caught at one time by using this method.

FILLETS:

"The Expressible Fluid of Fish Fillets. V.--Cell Damage in Fillets Frozen from One Side: the General Picture," by R. M. Love, article, Journal of the Science of Food and Agriculture, vol. 8, 1957, pp. 238-242, printed. Society of Chemical Industry, 14 Belgrave Square, London, S.W. 1, England. Cell damage, as measured by the escape of deoxyribonucleic acid (DNA) into the intercellular spaces, was studied in cod fillets frozen from one side only at different rates. Three distinct types of damage were revealed by peaks in the DNA versus freezing time curves, at freezing times of about 27, 75, and more than 125 minutes.

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

FISH FLOUR:

"La Poudre de Poisson Frais Deshydrate pour l'Alimentation de l'Homme (Dehydrated Fresh Fish Powder for Human Nutrition)," by O. A. Roels, article, *Bulletin Agricole du Congo Belge*, vol. 48, 1957, pp. 423-438, printed in Flemish and French. *Ministere des Colonies, Direction de l'Agriculture, des Forets, de l'Elevage et de la Colonisation, 7 Place Royale, Brussels, Belgium*. Fish offers the best opportunity for increasing the world's supply of protein, and in tropical countries it is most easily and cheaply preserved and handled in the form of a dry powder. Fish powder for human consumption is already being manufactured in the Gold Coast, South Africa, Uganda, and Chile, and the United Nations Organization is supporting the establishment of new factories for fish powders intended for supplementing the diets of children. Nondeodorized powder is already popular in some regions; in others, deodorized powder is preferred, and may be incorporated in bread. Methods of processing are continually being improved, with the aim of retaining all the nutritive value of the raw material.

FISH MEAL PLANTS:

"Magnet Installation at Fish Meal Plants in the Union and S. W. Africa," by R. J. Nachenius, article, *Food Industries of South Africa*, vol. 9, n. 7, 1956, pp. 35-36, printed. *Odhams Press, 16 Bree St., P. O. Box 4245, Capetown, South Africa*. The selection, and installation in fish meal plants, of magnets for removing fish tags are discussed. The specifications and prices of 7 magnets available in South Africa are listed.

FLORIDA:

Effects of Storms on the Shallow-Water Fish Fauna of Southern Florida with New Records of Fishes from Florida, by C. Richard Robins, *Contribution No. 178 from The Marine Laboratory, 10 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 7, no. 3, September 1957, pp. 266-275.) The Marine Laboratory, University of Miami, Coral Gables, Fla.* Discusses fish kills caused by several days or weeks of steady inshore winds in regions where turbulent weather is unusual. Apparently fish become established in shallow exposed locations during calm weather and then perish during storms from erosion of their gill filaments caused by accumulated sediments in the water. Of the specimens collected after a storm kill in the region of Miami, Fla., several were previously unrecorded or of rare occurrence in Florida waters.

FLOUNDERS:

Experimental Investigations on Variation in Plaice (PLEURONECTES PLATESSA Linne), by Arvid R. Molander and Martha Molander-Swedmark, *Series Biology, Report No. 7, Fishery Board of Sweden, 45 pp., illus., printed in Swedish. Institute of Marine Research, Lysekil, Sweden, 1957.*

FAO:

"Fisheries Products for Tropical Consumption," by C. L. Cutting and Kaare Bakken, article, *FAO Fisheries Bulletin*, vol. X, no. 3, July-September

1957, pp. 113-129, printed, 30 cents single copy. *Food and Agriculture Organization of the United Nations, Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.* A report on the activities of an FAO Working Group devoted to the development of new or improved fisheries products in Europe and North America which might find acceptance by the protein-needy populations of Africa and Asia. Discusses a survey of food habits of native populations in tropical countries and territories to learn their tastes in fish products, how their needs are met by domestic production and imports, and at what price. Reports on the possible products, especially those manufactured with herring, that might find acceptance in the tropical areas and the economic feasibility of providing those products.

FOOD AND AGRICULTURE ORGANIZATION:

Yearbook of Fishery Statistics (Annuaire Statistique des Peches, Anuario Estadistico de Pesca) -- Production and Fishing Craft (Production et Bateaux de Peche, Produccion y Embarcaciones de Pesca), 1955-56, vol. VI, 420 pp., illus., processed in English, French, and Spanish, US\$3. *Food and Agriculture Organization of the United Nations, Rome, Italy, 1957. (Sold in United States by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.)* As in previous years, the newest edition of the FAO Yearbook contains statistics on catches, production of preserved and processed commodities, fishing craft, and whaling from all countries. Improved reporting from the various countries is reflected in refinements and extensions of several tables. Data are mostly for 1956.

FREEZING:

"Findus, et Moderne Storanlegg for Frysing av Fisk" (Findus, a Modern Large Capacity Plant for Fish Freezing in Norway), by O. Devik, article, *Kyltek. Tidsskr.*, vol. 16, no. 2, 1957, p. 37, illus., printed in Swedish. Photostat copies, microfilms, or translations may be purchased from the library of the *Institut International du Froid, 177 Boulevard Malesherbes, Paris 17^e, France.*

FRENCH EQUATORIAL AFRICA:

Pescadores Negros entre Chad y Congo (Native Fishermen between the Chad and Congo Rivers), by Dr. Georges Denler de La Tour, 124 pp., illus., printed in Spanish. *Federacion Argentina de Entidades Deportivas de Pesca, Buenos Aires, Argentina, 1955.* Presents an account of the fishery of the Chad and Congo River basins in French Equatorial Africa. The text and many photographs and diagrams show the gear used and the fish caught in this tropical region.

GENERAL:

"How Fishes Swim," by Sir James Gray, article, *Scientific American*, vol. 197, no. 2, August 1957, pp. 48-54, illus., printed, single copy 50 cents. *Scientific American, Inc., 415 Madison Ave., New York 17, N. Y.* Describes a study of the swimming achievements of fish and whales. The speed of small fishes was measured in the laboratory and their power calculated. Similar observations were made of fish in their native environment.

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

HERRING:

The Herring and Its Fishery, by W. C. Hodgson, 210 pp., printed. Routledge & Kegan Paul, London, England. Describes the life history of Clupea harengus, commonly known as herring. Gives an account of the extensive scientific investigations to determine the cause for the drastic shortage of herring shoals off the East Anglian coast. Presents an interesting discussion of the methods and progress of fishery research and provides an insight into the work of the little-known herring industry.

Die Heringsfischerei in Europaischen Nordmeer (The Herring Fishery of the North Seas of Europe), by K. Schubert and A. Wulff, 27 pp., illus., printed in German. Institut fur Seefischerei, Hamburg, Germany, 1956.

On the Herring of the Southern North Sea, by D. H. Cushing and A. C. Burd, Fishery Investigations, Series II, Vol. XX, No. 11, 31 pp., illus., printed. Her Majesty's Stationery Office, York House, Kingsway, London W.C. 2, England, 1957. Contains four papers: (1) "The Downs Herring," (2) "Natural Changes," and (3) "The Effect of Fishing on the Stock of the Downs Herring," by D. H. Cushing, and (4) "Changes Ascribed to Fishing," by A. C. Burd. The four papers discuss the possible natural and man-made causes of the serious and disappointing scarcity of herring off the coast of England.

HYDROGRAPHY:

Benthic Animals as Indicators of Hydrographic Conditions and Climatic Changes in Svalbard Waters, by R. W. Blacker, Fishery Investigations, Series II, Vol. XX, No. 10, 49 pp. text, 5 folders of tables, illus., printed. Her Majesty's Stationery Office, York House, Kingsway, London, W. C. 2, England, 1957. Discusses the hydrographic changes reflected by studies of benthos--bottom-living marine organisms--in the Norwegian islands that compose the Svalbard region.

ICING:

"Badania nad Wplywem Lodu Azotynowanego na Trwalosc i Jakosc Dorsza Balttyckiego" (Investigations on the Influence of Sodium Nitrite Ice on Storage Life and Quality of Baltic Cod), by J. Borowik, E. Fischer, S. Ostrowski, and P. Trzesinski, article, Przemysl Spozywczy, no. 7, 1956, pp. 282-283, printed in Polish. Photostat copies, microfilms, or translations may be purchased from the library of the Institut International du Froid, 177 Boulevard Malesherbes, Paris 17^e, France.

"Zmiany Zawartosci Azotynu Sodiu w Lodzie Azotynowanym" (Changes in Sodium Nitrite Content in Nitrited Ice), by J. Borowik and S. Ostrowski, article, Roczn. Zakl. Hig., vol. 7, 1956, pp. 35-42, printed in Polish. Photostat copies, microfilms, or translations may be purchased from the library of the Institut International du Froid, 177 Boulevard Malesherbes, Paris 17^e, France.

INDONESIA:

Berita Perikanan, Vol. IX, No. 1-2, Mar.-Apr. 1957, 28 pp., illus., printed in Indonesian and English.

Berita Perikanan, Djalen Kerapu 12, Djakarta-Kota, Indonesia. This issue has been published in both Indonesian and English to honor the special occasion in which Indonesia was chosen to be host to the Seventh Session of the Indo-Pacific Fisheries Council at Bandung on May 13-27, 1957. Contains, among others, the following articles: "'Paddy-Cum-Milkfish' Culture, A Creation from the Lowlands of the Solo River," by Abdoessamad Djaingsastro; "Some Applications in Seafisheries of Methods used in Inland Fisheries," by Dr. K. F. Vaas; "Light Fishery in the Riau Archipelago," by V. Soesant; and "The Function of Fish Auction in the Development of Fisheries Organization," by Eddiwan.

JAPAN:

The Central Wholesale Market Law; The Enforcement Order Concerning the Central Wholesale Market Law; The Enforcement Regulations for the Central Wholesale Market Law, 33 pp., printed. Fisheries Products Market Improvement Association, Tokyo, Japan, May 1957.

LABORATORY:

A New Federal Fishing Laboratory on the Gulf, by Charles Butler, 3 pp., printed. (Reprinted from Proceedings of the Gulf and Caribbean Fisheries Institute, Ninth Annual Session, November 1956, pp. 45-47.) The Marine Laboratory, University of Miami, Coral Gables, Fla.

LOBSTERS:

"Studies on the Black Discoloration of Lobster. I--Origin of Discoloration," by D. Kakimoto and A. Kanazawa, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 22, 1956, pp. 471-475, printed in Japanese with summaries in English. Japanese Society of Scientific Fisheries, Tokyo, Japan. Black discoloration of the spiny lobster, Panulirus japonicus, was found to be due to the action of an enzyme in the blood on a constituent of the liver. The darkening was most active at pH 7, and did not occur below pH 4; it was not influenced by light. By means of the method used for the separation of melanin, two black pigments with closely similar absorption curves were separated from incubated mixtures of blood and liver; an incubated mixture of blood and L-tyrosine gave only one pigment.

"Studies on the Black Discoloration of Lobster. II--Relation between Tyrosinase and Black Discoloration," by D. Kakimoto and A. Kanazawa, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 22, 1956, pp. 476-479, printed in Japanese with summaries in English. Japanese Society of Scientific Fisheries, Tokyo, Japan.

MASSACHUSETTS:

Annual Report, Division of Marine Fisheries, 1957, 42 pp., processed. Department of Natural Resources, Division of Marine Fisheries, Boston, Mass. Describes the problems of the Massachusetts fishing industry and the most important developments during the fiscal year 1957. The condition of the Massachusetts deep-water fishery and the fishery research and management projects pertaining to that industry are

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

discussed. This report also discusses the purpose and functions of the International Commission for the Northwest Atlantic Fisheries; studies by the Woods Hole Oceanographic Institution; shellfish propagation and conditions in Massachusetts coastal waters; lobsters; the fishways program; and the striped bass project. Catch statistics are presented.

NEW YORK CITY:

Food for New York's Millions, 20 pp., printed. Department of Markets, Bureau of Consumers' Service and Research, New York City, N. Y. This booklet brings together facts and figures relating to New York City's food supply, showing the size and importance of the New York market. The section on fish explains the marketing system, and lists the various species of fish and shellfish which are received in New York and the major sources of supply.

NEW ZEALAND:

Report on Fisheries for 1956, 40 pp., printed. Marine Department, Wellington, New Zealand, 1957. A report on the fisheries of New Zealand which discusses crayfish; fishing vessels and personnel; fish landings; methods of capture; landings by ports; exports and imports; big-game fishing; fish-liver oil; whaling; oysters; toheroa; whitebait; mussels; fresh-water fisheries and research; marine research; legislation; and common and scientific names of fish and shellfish. Included also are statistical tables giving detailed data on the fisheries.

NORWAY:

Norges Fiskerier, 1955 (Fishery Statistics of Norway), Norges Offisielle Statistikk XI, no. 275, 97 pp., illus., printed in Norwegian with foreword, table of contents, and summary in English. Director of Fisheries of Norway, Bergen, Norway, 1957. A detailed statistical report on the fisheries of Norway with discussions of the number of fishermen, craft, processing plants, and gear; quantity and value of total landings; herring, sprat, cod, mackerel, tuna, dogfish, and capelin 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. 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 type of fishing gear.

OCEANOGRAPHY:

A Manual for Oceanographic Observers Aboard U. S. Fish and Wildlife Service Exploratory Fisheries Vessels, by Eugene E. Collins, Special Report no. 23, 91 pp., processed. Department of Oceanography, University of Washington, Seattle, Wash., May (rev. July) 1956.

OYSTERS:

"Effect of Aureomycin Chlortetracycline in the Processing and Storage of Freshly Shucked Oysters," by Anthony Abbey, A. Richard Kohler, and

Sidney D. Upham, article, Food Technology, vol. 11, May 1957, pp. 265-271, printed. Institute of Food Technologists, 176 W. Adams St., Chicago, Ill. Describes the materials, methods, and results of a study in which the authors evaluated the use of chlortetracycline (CTC) in prolonging the fresh storage life of shucked oysters.

PERU:

Investment in Peru (Basic Information for United States Businessmen), 157 pp., illus., printed, \$1.25. U. S. Department of Commerce, Bureau of Foreign Commerce, Washington, D. C. (May be purchased from any Field Office of the Department of Commerce or from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A handbook designed to provide basic economic and commercial information for investors as well as foreign traders. The book is divided into three parts--Part 1. Investment in Peru, The Overall View; Part 2. The Peruvian Economy; and Part 3. Business and Tax Law. The part on the Peruvian economy includes a section on manufacturing industries, which contains a description of all phases of the fishing industry in Peru. The value of this book is substantiated by the inclusion of three appendixes covering U. S. companies operating in Peru, entry requirements, and Peruvian representatives in the United States. Two maps of Peru and a large quantity of statistical tables are also included.

PHILIPPINES:

Fisheries Statistics of the Philippines, 1956, 64 pp., processed. Department of Agriculture and Natural Resources, Bureau of Fisheries, Manila, Philippines. This report is devoted to fishery production in the Philippines. The tables are grouped together under the headings (1) production, consumption, and requirement; (2) commercial fishing vessels; (3) fish ponds; (4) foreign trade; and (5) other data. The tables are subdivided according to gear used, kind of fish caught, monthly production, and fishing grounds. There are also statistics on fish pond production, and imports and exports of fishery products (including canned and processed fish). Statistics also cover reptile skins, seaweeds, sharkfins, shells, sponges, trepang, turtle eggs, and turtle shells. The appendixes contain information on the fishery districts, the forms used in collecting fishery statistics, and an inventory of fishing gear used in the Philippines for the year 1953. Except for Table 1 which presents fish production data since 1946, most of the information covers the five-year period 1952-56.

PORTUGAL:

Gremio dos Armadores da Pesca de Arrasto, Relatório e Contas do Exercício de 1956 e Orçamento para 1957 (Trawler Owners' Guild, Statement of Operations for 1956 and Budget for 1957), 52 pp., printed in Portuguese. A Comissão Revisora de Contas, Lisbon, Portugal.

Gremio dos Armadores de Navios da Pesca do Bacalhau, Relatório e Contas do Exercício de 1956 e Orçamento para 1957 (Cod Fishing Vessel Owner's Guild, Statement of Operations for

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

1956 and Budget for 1957), 40 pp., printed in Portuguese. A Comissao Revisora de Contas, Lisbon, Portugal.

PRESERVATION:

The Freezing Preservation of Foods (Third Edition), Vol. II - Freezing of Precooked and Prepared Foods, by Donald K. Tressler and Clifford F. Evers, 559 pp., illus., printed, postpaid price \$10 domestic and \$11 foreign. The Avi Publishing Co., Inc., 7 Taylor Place, Westport, Conn., 1957. In this, the second of the two volumes comprising the third edition of their book on the freezing preservation of food, the authors have presented a detailed exposition of the new and already remarkably diversified field of frozen prepared and precooked foods. A brief history of the rise of this new field of food processing and a generalized discussion of its special problems is developed. These are followed by a detailed analysis of the composition and processing of some 17 different classes of such prepared and precooked foods. Chapters 1, 2, 3, 22, 23, and 24 deal with the history, handling, packaging, and utilization of such foods in general and should be of value to all in this field. Of especial interest to the fishery and allied industries are chapters 5, 10, and 11, totaling 56 pages, which deal with soups, chowders and stews, precooked fish, fish dishes and potpies, and with prepared and precooked shellfish, respectively. The authors have performed a great service to the frozen foods industry in collecting, assessing, collating, and organizing the great mass of published material into one authoritative source. The 126 illustrations and 66 tables, as well as the numerous product formulae and extensive bibliographies which are presented, render this book of great value to the technologist and processor. It should be of equal value as a basic reference text to both newcomers and to old-timers in the field of prepared and precooked frozen foods. Vol. I - Freezing of Fresh Foods, by Donald K. Tressler and Clifford F. Evers, 1,240 pp., illus., printed, \$18 domestic and \$19 foreign (reviewed in Commercial Fisheries Review, vol. 19, no. 7, July 1957, p. 58).

--John A. Holston

PRESERVATION BY IRRADIATION:

"Possibilities of Irradiated Foods Pointed Up by Experimental Meal," article, Quick Frozen Foods, vol. 19, June 1957, pp. 44-45, 1956, printed. E. W. Williams Publishers, 82 Wall Street, New York 5, N. Y. Describes a mass sampling of foods, including tuna, preserved by irradiation. Discusses the advantages and disadvantages of the irradiation preservation process--a process which is expected to supplement the processes of canning and freezing in the near future. Also describes an ionizing radiation center that is scheduled to be built in Lathrop, Calif., in October of 1958.

QUALITY:

"Indexes of Freshness in Edible Fish," by Enrique Pierangeli, Juan F. Garcia Crespo and Rogelio B. Lopez, article, Revista de la Asoc.

Argentina Dietologica, vol. 13, 1954, pp. 67-82, printed. (Abstracted in Chemical Abstracts, vol. 51, April 25, 1957, p. 6033.) Argentine Association of Dietology, Calle Cordoba 3120, Buenos Aires, Argentina. Reports on the correlation found between the volatile basic N (I) and the freshness of fish. The organoleptic characteristics and I levels are given for 68 samples representing 18 varieties of fish.

"Some Objective Methods for Evaluating the Freshness of Fish," by H. Bukowska, article, Przemysl Spozywczy, vol. 9, 1955, pp. 199-200, printed. (Abstracted in Food Science Abstracts, vol. 28, October 1956, p. 467.) Przemysl Spozywczy, al. Niepodleglosci 188, Warsaw 12, Poland. Describes proposed methods of determining the freshness of fish based on the change in color produced when amino acids react with bromothymol blue.

"The Use of Tetrazolium Salts for Assessing the Quality of Iced White Fish," by J. M. Shewan and J. Liston, article, Journal of the Science of Food and Agriculture, vol. 8, 1957, pp. 222-226, printed. Society of Chemical Industry, 14 Belgrave Square, London, S. W. 1, England. A standard procedure was evolved for assessing the quality of iced gutted round fish such as haddock and cod. It consists of applying a moistened test paper impregnated with tetrazolium salt to the moist surface of the fish, and after two minutes, eluting from the paper the resultant red-colored formazan and estimating its concentration colorimetrically. Quality assessment, as judged by a taste panel, can then be correlated with formazan concentration. Results obtained by this method are compared with those obtained by organoleptic examination, viable bacterial counts, and contents of trimethylamine and total volatile bases.

"Volatile Bases as Quality Indices of Iced North Sea Cod," by J. M. Shewan and A. S. C. Ehrenberg, article, Journal of the Science of Food and Agriculture, vol. 8, 1957, pp. 227-231, printed. Society of Chemical Industry, 14 Belgrave Square, London, S. W. 1, England. Two chemical variables (contents of trimethylamine and total volatile bases) and four sensory variables (odor and appearance of the raw fish, and odor and flavor of a middle cut of the cooked fish) were assessed at intervals during the spoilage of different catches of North Sea and Iceland fish stored in ice for up to 22 days. The data were analyzed by deriving quantitative relationships between the various observed variables.

REFRIGERATION:

"Koling af Fisk om Bord" (Refrigeration of Fish on Board), by F. Bramsnaes, article, Kulde, vol. 11, no. 2, pp. 13-16, illus., printed in Danish. Photostat copies, microfilms, or translations may be purchased from the library of the Institut International du Froid, 177 Boulevard Malesherbes, Paris 17^e, France.

"Ulteriori Ricerche sul Comportamento della Temperatura in Pesci Conservati con Ghiaccio d'Acqua di Mare" (New Tests Concerning the

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

Temperature of Fish Stored with Sea Water Ice), by P. Savi and G. Braccio, *Il Freddo*, vol. 10, no. 5, September-October 1956, pp. 11-12, printed in Italian. Photostat copies, microfilms, or translations may be purchased from the library of the Institut International du Froid, 177 Boulevard Maiesherbes, Paris 17^e, France.

SALMON:

Food of Salmonid Fishes of the North Pacific Ocean, by William I. Aron, *Fishery Report* no. 4, 10 pp., printed. Department of Oceanography, University of Washington, Seattle, Wash., November 1956.

The Incomes of Salmon Fishermen in British Columbia, 1953-1954, by D. R. Buchanan and B. A. Campbell, *Primary Industry Studies* No. 2, 110 pp., illus., processed. Economics Service, Department of Fisheries of Canada, Ottawa, Canada, 1957. Due to the importance of the salmon fishery in the economy of British Columbia, changes in the volume of catch, in prices, and in fishing costs have a significant effect on the well-being of a large segment of the Province's population. This report presents the results of an investigation of the changes in the income of salmon fishermen in British Columbia between the seasons of 1953 and 1954. An outline of the historical development and present conditions of salmon production and marketing on the Canadian Pacific Coast is included as background material.

"Studies on the Manufacture of Canned Salmon. I.--The Odour in Canned Salmon Manufactured from Frozen Fish as the Raw Material. (1) Chemical Components of the Odour of Canned Salmon Made from Frozen Fish," by E. Tanikawa, T. Motohiro, and S. Shoji, article, *Bulletin of the Faculty of Fisheries*, Hokkaido University, vol. 6, 1956, pp. 317-319, printed in Japanese with summaries in English. Hokkaido University, Hakodate, Japan. Off-odors or off-flavors have been observed in canned salmon prepared from frozen fish. The chemical constituents of the odorous substance separated by steam distillation from canned salmon, prepared from fresh or from frozen salmon, were examined by paper partition chromatography, and a detector tube.

"Studies on the Manufacture of Canned Salmon. II.--The Odour in Canned Salmon Manufactured from Frozen Fish as the Raw Material. (2) On the Particular Odour in the Refrigerated Warehouse," by E. Tanikawa, T. Motohiro, and S. Shoji, article, *Bulletin of the Faculty of Fisheries*, Hokkaido University, vol. 6, 1956, pp. 320-324, printed in Japanese with summaries in English. Hokkaido University, Hakodate, Japan. Two possible causes of the off-odor in canned salmon prepared from frozen fish were considered. The first was that oxidative decomposition of the salmon fat during frozen storage results in the formation of various decomposition products such as aldehydes and volatile acids; in fact when fresh salmon was frozen at -15° C., sufficient decomposition products were formed after storage for 50 days to be detectable organoleptically. The second possible cause was that odors present in the refrigerated warehouse penetrate into the tissue of salmon stored in the

room. A study of the odor present in a refrigerated warehouse for fish revealed the presence of ammonia, ethylene, formaldehyde, and acetaldehyde.

"Studies on the Manufacture of Canned Salmon. III.--The Odour in Canned Salmon Manufactured from Frozen Fish as the Raw Material. (3) On the Oxidative Rancidity of Salmon Fats during Cold Storage," by E. Tanikawa, T. Motohiro, and S. Shoji, article, *Bulletin of the Faculty of Fisheries*, Hokkaido University, vol. 6, 1956, pp. 325-330, printed in Japanese with summaries in English. Hokkaido University, Hakodate, Japan. A study was made of the oxidative changes occurring in fresh and stale fish, and in fish to which Sustane 1-F (butylated hydroxyanisole) had been added, during refrigerated storage at 15° C. for periods up to 108 days. Changes in the acid, saponification, iodine, ether extract, and peroxide-oxygen values indicated that oxidative processes commence early in storage; later little further change occurs, although oxides and peroxides tend to increase in amount throughout the storage period. The addition of Sustane 1-F was found to inhibit the oxidation. Samples that were initially stale were oxidized more easily throughout the storage period than fish that was initially fresh. Salmon fats underwent hydrolysis during storage, and the higher fatty acids formed further decomposed to lower fatty acids or aldehydes, which contributed to the odor in the refrigerated warehouse.

"Studies on the Manufacture of Canned Salmon. IV.--The Odour in Canned Salmon Manufactured from Frozen Fish as the Raw Material. (4) Changes in the Various Types of Nitrogen in Salmon Meat during Cold Storage," by E. Tanikawa, T. Motohiro, and S. Shoji, article, *Bulletin of the Faculty of Fisheries*, Hokkaido University, vol. 6, 1956, pp. 331-335, printed in Japanese with summaries in English. Hokkaido University, Hakodate, Japan. In experiments using fresh and stale fish and fish to which Sustane 1-F had been added, it was found that the solubility of the protein of the salmon meat in 0.2 percent sodium hydroxide solution tended to increase with increasing duration of frozen storage. The contents of volatile basic nitrogen and amino acid nitrogen increased during storage, probably owing to autolysis or oxidative decomposition of the salmon; the amount of total nitrogen decreased. The results of examination of solubility, pH, and fluorescence on irradiation with ultraviolet light suggest the occurrence of an amino-carbonyl reaction. Changes in the proteins occurred in fish containing Sustane 1-F as well as in the untreated material. It was concluded that the decomposition of the protein in salmon had less effect on the formation of the odor associated with canned salmon prepared from frozen fish than did decomposition of the fats.

"Studies on the Manufacture of Canned Salmon. V.--The Odour in Canned Salmon Manufactured from Frozen Fish as the Raw Material. (5) Changes in the Volatile Compounds in Salmon Meat during Cold Storage," by E. Tanikawa, T. Motohiro, and S. Shoji, article, *Bulletin of the*

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

Faculty of Fisheries, Hokkaido University, vol. 6, 1956, pp. 336-340, printed in Japanese with summaries in English. Hokkaido University, Hakodate, Japan. Changes occurring during cold storage in the volatile components of fresh and stale salmon, and of salmon to which Sustane 1-F had been added, were followed by means of paper chromatography. The presence of many volatile bases and acids was observed as the storage progressed; this was most noticeable in the sample that was initially stale, and least in the sample treated with Sustane 1-F. The sample that was initially fresh contained the volatile bases cadaverine and piperidine, while the stale sample also contained agmatine and amylamine. Of the volatile acids, only formic acid was detected in the early part of the storage period, but in the later stages higher fatty acids appeared successively. For the manufacture of a canned product of good quality, the salmon should not be kept in frozen storage for longer than 50 days, and it should be initially fresh.

SANITATION:

Fish Sanitation, 25 pp., illus., processed. Los Angeles City Health Department, 111 East First St., Los Angeles 12, Calif. An outline of the factors which help the Los Angeles City Health Department in its fish inspection work to detect the difference between good and bad fish. Contains a list of the varieties of fish commonly seen in the Los Angeles retail markets. Discusses among other items the principal factors causing spoilage in fish, characteristics of good and off-condition fish; care of fish and shellfish; examples of biological and chemical methods and tests for freshness of fish and fishery products; some diseases of man due to fish and shellfish; and storage life of frozen fish. Also presents drawings of the different cuts of fish and market forms of fresh and frozen fishery products, and definitions of terms used in the fishing industry.

SARDINES:

"Canada's Sardine Industry," article, Trade News, vol. 10, no. 9, September 1957, pp. 4-7, illus., printed. Department of Fisheries, Ottawa, Canada. Charlotte County, New Brunswick, is the heart of the Canadian sardine industry, and claims the largest sardine canning plant in the British Commonwealth. This fame is based on the vast schools of young herring, canned as sardines, which swarm into the Bay of Fundy waters yielding abundant silvery harvests to the local fishermen, giving employment to nearly 1,000 shoreworkers, and making a valuable contribution to the Province's economy. Illustrations show the various steps in the sardine canning industry from the time the sardine carriers are unloaded at the wharveside of the canning plant until the cans are labelled and wrapped.

The Number of Pilchards in the Channel, D. H. Cushing, Fishery Investigations, Series II, Vol. XXI, No. 5, 27 pp., illus., printed. Her Majesty's Stationery Office, York House, Kingsway, London W. C. 2, England, 1957. Discusses the purpose, methods, and results of a pilchard

survey conducted in a series of cruises on the English Channel in the summer of 1950. Data were collected on the following: distribution of pilchards in the Channel; echo traces showing the vertical distribution of pilchards; estimated number of adult pilchards in the Channel; the number of fish recorded by each echo-sounder transmission; relation of the pilchard to its environment--covering spawning and temperature, phytoplankton, and zooplankton; and variations in abundance of pilchards.

SEAWEED:

"Seaweed Colloids. \$10 Million Now--and Growing Fast," by B. Idson, article, Chemical Week, vol. 79, no. 29, July 21, 1956, 24 pp., illus., printed. McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y. Reports on the polysaccharides or seaweed colloids obtained from processing brown and red seaweeds. These colloids are very valuable in industrial chemical use as thickeners, humectants, coagulants, bulking agents, flocculation agents, and antibiotic carriers. The author discusses the extraction of agar, carrageenin, and algin and presents a chemical description of each. Discussion is also given of the raw materials, mechanized harvesting, processing, marketing, research, and perspective of the seaweed colloid industry.

"Nova Scotia Plant Makes Insulation from Eel Grass," article, Maine Coast Fisherman, vol. 11, no. 12, December 1956, p. 5, printed. The Maine Coast Fisherman, 184½ Middle St., Portland 3, Me. Reports on a plant in Nova Scotia, Canada, that manufactures insulation from eel grass. The eel grass, which grows underwater offshore and then breaks off and floats shoreward, must be gathered from the shallow water and then dried in open fields before it is hauled to the plant. This task can be accomplished by fishermen working on their own time between seasons and can be a means of augmenting the fishermen's income by \$300 or \$400.

SHARKS:

"Sharks v. Men," by George A. Llano, article, Scientific American, vol. 196, no. 6, June 1957, pp. 54-61, illus., printed, single copy 50 cents. Scientific American, Inc., 415 Madison Ave., New York 17, N. Y. Presents the geographical distribution of the various species of "man-eating" sharks and records of shark attacks. According to the author, there are about 250 known species of sharks, and the largest of them--the whale shark, the basking shark, and the sleeping shark--are the most inoffensive of all sea creatures. The sharks that have the teeth, jaws, and instincts necessary for a rapacious way of life, and that have been incriminated as man-eaters, are limited to three families. The great white shark, credited with being the most ferocious monster of the deep, is a member of the "mackerel" family. The second group of dangerous sharks is known as the "requiem" family, and the third family of sharks reported to attack man are the "hammerheads," so-called because of their large rudderlike heads.

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

SHRIMP:

Royal Red Shrimp--A New South Atlantic Resource, by Harvey R. Bullis, Jr., 4 pp., printed. (Reprinted from Proceedings of the Gulf and Caribbean Fisheries Institute, Ninth Annual Session, November 1956, pp. 56-60.) The Marine Laboratory, University of Miami, Coral Gables, Fla.

"Shrimps and Shrimp Fishing Methods in the U. K.," by H. S. Noel, article, World Fishing, vol. 6, no. 6, June 1957, pp. 51-55, illus., printed. John Trundell Ltd., Temple Chambers, Temple Ave., London, E. C. 4, England. A description of British shrimping methods, covering only the inshore fisheries where the catch is cooked on board and landed daily. It describes the two types of shrimp--brown (Crangon vulgaris) and pink or Aesops prawn (Pandalus montagu)--which are found in British coastal waters; the type of trawl used in the fisheries; and methods of handling, cooking, and marketing.

"Toxicity of an Insecticide to Two Species of Shrimp, Penaeus aztecus and Penaeus setiferus," by Edward Chin and Donald M. Allen, article, The Texas Journal of Science, vol. IX, no. 3, September 1957, pp. 270-278, printed, single copy \$1.25. The Texas Academy of Science, Box 7984, University Station, Austin, Tex.

Ways and Means of Stabilizing the Shrimp Market, by Richard A. Kahn, 9 pp., illus., printed. (Reprinted from Proceedings of the Gulf and Caribbean Fisheries Institute, Ninth Annual Session, November 1956, pp. 78-87.) The Marine Laboratory, University of Miami, Coral Gables, Fla.

SMALL BUSINESS:

Profitable Buying for Small Retailers, by Harry A. Lipson, Small Marketers Aids No. 28, October 1957, 4 pp., printed, free. Small Business Administration, Washington 25, D. C.

SNAILS:

"The Edible Snail," by Jean Cadart, article, Scientific American, vol. 197, no. 2, August 1957, pp. 113-114, 116, 118, illus., printed, single copy 50 cents. Scientific American, Inc., 415 Madison Ave., New York 17, N. Y. A brief description of the edible snail's anatomy and physiology, its characteristics and habits.

SOUTH AFRICA:

Fishing Industry Research Institute, Tenth Annual Report of the Director, 1st April 1956-31st December 1956, 43 pp., illus., printed. Fishing Industry Research Institute, Cape Town, South Africa. Includes brief accounts of the progress in the Institute's program of fisheries research for the nine-months' work during April 1 to December 31, 1956. Attention has been given to investigations covering fresh fish, fish canning, spiny lobster, fish meal and oil, fish flour, and routine inspections and analysis.

SPAIN:

Investigacion Pesquera (Fishery Investigation), vol. VIII, 134 pp., illus., printed in Spanish. In-

stituto de Investigaciones Pesqueras, Universidad de Barcelona, Barcelona, Spain, 1957. Contains, among others, the following article:

"Datos sobre la edad y crecimiento del Bacalao (Gadus callarias, L.) de Terranova" (Data on the Age and Growth of Cod, Gadus callarias, L., de Terranova), by A. Figueras.

STURGEONS:

"River Sturgeons of the American Genus Scaphirhynchus: Characters, Distribution, and Synonymy," by Reeve M. Bailey and Frank B. Cross, article, Papers of the Michigan Academy of Science, Arts, and Letters, vol. 39, pp. 169-208, illus., printed. The University of Michigan Press, Ann Arbor, Mich., 1954.

SWEDEN:

"Cost and Profit in Swedish Fishing Vessels," by Docent Ingemar Gerhard, article, FAO Fisheries Bulletin, vol. X, no. 3, July-September 1957, pp. 131-141, illus., printed, 30 cents single copy. Food and Agriculture Organization of the United Nations, Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y. Describes cost and profit investigations conducted on vessels of various sizes engaged in the sea fisheries off the west coast of Sweden mainly during the period 1951-1953.

SWORDFISH:

"Studies on Jellied Meat of Sword Fish--(1) Numerical Change of Parasitic Germs in the Jellied Meat of Sword Fish During Cold Storage and (2) Free Amino Acids Occurring in Jellied Meat Stored at -18° C. for Ten Months," by Y. Tsuchiya and H. Kudo, articles, Refrigeration, vol. 32, no. 353, March 1957, pp. 12-14, 15-17, illus., printed in Japanese and English. Photostat copies or microfilms may be purchased from the library of the Institut International du Froid, 177 Boulevard Malesherbes, Paris 17^e, France.

TAGGING:

"New Tattooing Devices for Marking Juvenile Salmon," by William A. Dunstan and Wallace E. Bostick, article, Fishery Research Papers, vol. 1, no. 4, March 1956, pp. 70-79, illus., printed. Washington Department of Fisheries, Olympia, Wash.

TAIWAN:

The Use of Chemical Fertilizers in the Milkfish Ponds of Taiwan, by Yun-an Tang and Tung-Pai Chen, Fisheries Series No. 3, 23 pp., illus., printed, NT\$3 (12 U.S. cents). Joint Commission on Rural Reconstruction, 25 Nanhai Rd., Taipei, Taiwan, China, August 1957. This report, dealing in general with the improvement of milkfish ponds in Taiwan, presents the results of a series of experiments in the enrichment of ponds by fertilization with chemical fertilizers. This type of work is necessarily of long-term nature and requires large-scale experimentation. This report is intended as a progress report on the findings of the past four years on this subject.

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

TIDAL CURRENTS:

Tidal Current Tables, 1958 (Atlantic Coast of North America), 185 pp., illus., processed, 50 cents. Coast and Geodetic Survey, U. S. Department of Commerce, Washington 25, D. C. Contains five tables giving daily current predictions for the Atlantic coast of North America, current differences and other constants, velocity of current at any time, duration of slack, and rotary tidal currents. Also gives an explanation of the Gulf Stream, wind-driven currents, the combination of currents, and current diagrams. Astronomical data are also included.

Tidal Current Tables, 1958 (Pacific Coast of North America and Asia), 235 pp., illus., processed, 50 cents. Coast and Geodetic Survey, U. S. Department of Commerce, Washington 25, D. C. Contains four tables giving the daily current predictions for the Pacific coast of North America and Asia, current differences and constants, velocity of current any time, and duration of slack. Also gives an explanation of the coastal tidal currents, wind-driven currents, and the combination of currents, and contains astronomical data.

TRADE LISTS:

The Office of Economic Affairs, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., published the following mimeographed trade list. Copies may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$2 each.

Oils (Animal, Fish, and Vegetable)--Importers, Dealers, Producers, Refiners, and Exporters--Japan, 23 pp. (September 1957). Contains the names and addresses, the relative size of each firm, type of products dealt in or produced by each firm, and the annual production by producers. Because of abundant aquatic resources and a well-developed fishing industry, Japan produces large quantities of various fish oils (including fish-liver oils and whale oil), of which roughly 75 percent is exported.

UGANDA:

Annual Report of the Game and Fisheries Department (For the Period 1st January 1955 to 30th June 1956), 153 pp., illus., printed, 6s. (84 U.S. cents). Government Printer, P. O. Box 33, Entebbe, Uganda, 1957. Includes a section on the fisheries of Uganda by regions: Lake Albert; Lakes George/Edward; and Lake Kyoga. General statistics and information on supplies of fishing gear; fish production, consumption of fish in Uganda, and exports of fish for 1955; boat building; fish stocking; equipment; fisheries research; and fish farming are some of the subjects covered. Deep-water fishing experiments on Lake Albert, the Albert Nile fishery as of April 1956, and experimental fishing on Lake Niamusigeri are also discussed. Other sections of the report deal with game.

UNDERWATER TELEVISION:

"Das Unterwasserfernsehen und Seine Technischen Anwendungen" (Underwater Television and

Its Technical Application), by W. Thomsen, article, *Die Umschau*, vol. 56, no. 18, September 1956, p. 565-568, illus., printed in German. Umschau-Verlag, Frankfurt-am-Main, W. Germany. Discusses the causes that restrict the use of underwater television and presents suggestions for overcoming some of the restrictions.

"Unterwasser-Fernsehen als Arbeitsmethode für die Gewässerkunde" (Underwater Television as Working Methods for Hydrography), by J. Scharfe, article, *Die Umschau*, vol. 56, no. 24, December 1956, pp. 741-743, illus., printed in German. Describes the use of underwater television cameras in observations of fishing gear in operation.

"Unterwasser-Fernsehen-Versuche im Königssee" (Underwater Television Experiments in the Königssee), by H. J. Elster and A. Brandt, article, *Archiv für Hydrobiologie*, Suppl. vol. 24, 1956, 12 pp., illus., printed in German. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, W. Germany. Deals with the use of the underwater television camera for biological investigations and presents the basic problems that arise from the use of artificial light in deep waters.

UNION OF SOUTH AFRICA:

Department of Nature Conservation, Report No. 13, 1956, 89 pp., illus., printed. Department of Nature Conservation, Inland Fisheries Administration, Cape Town, Union of South Africa. A complete report on the activities of the Union of South Africa's Department of Nature Conservation. The section on General Research and Services includes a report on fish farm studies of tilapia and bass and an article entitled "Report on Some of the Estuaries of the Eastern Cape," by G. F. van Wyk--covering the dominant fish and shellfish species found, including those suitable for use as bait. The section covering the Division of Inland Fisheries discusses conservation of carp; fish hatcheries which raise brook trout, various pondfish, and goldfish; and the stocking of public waters. Also included is a brief report on the Inland Fisheries Administration and the figures on the game licenses issued in 1956.

UNITED KINGDOM:

Sea Fisheries Statistical Tables, 1956, 38 pp. (mostly tables), printed, 4s. (56 U.S. cents). Ministry of Agriculture, Fisheries, and Food, London, England, 1957. (Available from Her Majesty's Stationery Office, London, England). Includes statistics on the quantity, total value, and average value of fish and shellfish production in England and Wales by species, region, and other categories for 1956. Breakdowns by first-class British vessels (steam trawlers), demersal landings, and pelagic landings are presented. Data on imports and exports are included. Also given are the number of fishermen, number and gross tonnage of vessels, and number of first-class vessels by stations and type of gear.

WARMOUTH:

Ecological Life History of the Warmouth (CENTRARCHIDAE), by R. Weldon Larimore, Illinois Natural History Survey Bulletin, Vol. 27, Article 1, August 1957, 83 pp., illus., printed. Illinois Natural History Survey, Natural Resources Building, Urbana, Ill.