

FISH AND WILDLIFE SERVICE PUBLICATIONS

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- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
 FL - FISHERY LEAFLETS.
 SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
 SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

- | Number | Title |
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| CFS-1185 | - Frozen Fish Report - Final - July 1955, 8 pp. |
| CFS-1189 | - South Atlantic Fisheries, 1953 - Annual Summary, 10 pp. |
| CFS-1197 | - Florida Landings - June 1955, 6 pp. |
| CFS-1199 | - Alabama Landings - April 1955, 2 pp. |
| CFS-1200 | - Alabama Landings - May 1955, 2 pp. |
| CFS-1201 | - Alabama Landings - June 1955, 2 pp. |
| CFS-1202 | - Texas Landings - July 1955, 3 pp. |
| CFS-1203 | - Rhode Island Landings - July 1955, 3 pp. |
| CFS-1204 | - Fish Meal and Oil - July 1955, 2 pp. |
| CFS-1205 | - Frozen Fish Report - Aug. 1955, 2 pp. |
| CFS-1206 | - North Carolina Landings - July 1955, 2 pp. |
| CFS-1207 | - New Jersey Landings - July 1955, 2 pp. |
| CFS-1208 | - New York Landings - July 1955, 4 pp. |
| <u>Summary Minutes, American Fisheries Advisory Committee Second Meeting, August 25-26, 1955, Boston, Mass., 9 pp., processed.</u> | |
| FL - 254 | - List of Fishery Associations in the United States, Alaska and Hawaii (revised May 1955), 12 pp., processed. |
| FL - 292 | - List of Fishery Cooperatives in the United States and Alaska (revised June 1955), 5 pp., processed. |
| FL - 424 | - Household Consumer Preferences for Breaded Shrimp & Breaded Fish Sticks, Part I - National and Regional Summary, by Richard A. Kahn and Walter H. Stolting, 61 pp., illus., processed, July 1955. |
| Sep. No. 416 | - Preliminary Report on Exploratory Long-Line Fishing for Tuna in the Gulf of Mexico and the Caribbean Sea: Part I - Exploratory Fishing by the Oregon; Part II - Long-Line Gear Used in Yellowfin Tuna Exploration. |
| Sep. No. 417 | - Brine Dipping of Haddock Fillets. |
| Sep. No. 418 | - Research in Service Laboratories (October 1955):
Technological Research on the Fresh-Water Fisheries of the U. S.
Iron-Sulfide Discoloration of Tuna Cans. |

- No. 1 - Theory of Iron-Sulfide Formation in Cans.
 Oyster Technological Research Continues During Summer.
 Jellied Salmon.
 New Federal Specifications for Certain Fishery Products.

SSR-Fish. No. 157 - Longline Fishing for Deep-Swimming Tunas in the Central Pacific, 1953, by Richard S. Shomura and Garth I. Murphy, 75 pp., illus., processed, September 1955. This is the fourth in a series of reports on a survey of the deep-swimming tunas of the central equatorial Pacific. This survey has been conducted by the Pacific Oceanic Fishery Investigations (POFI) as a portion of a larger investigation embracing the hydrography and productivity of the central Pacific as well as the fishery resources. Herein we summarize the salient features of six equatorial fishing cruises made between 140° W. and 170° W. longitude in 1953. In addition, the results of a considerable amount of Japanese fishing in 1953 between 160° W. longitude and 180° are discussed. Complete summaries of the POFI cruises and of the catch data from the Japanese fishing are given in the appendix.

SSR-Fish. No. 158 - Exploratory Experiments in Guiding Salmon Fingerlings by a Narrow D. C. Electric Field, by Parker S. Trefethen, 45 pp., illus., processed, June 1955.

SSR-Fish. No. 159 - Movements of Small Soft-Shell Clams (*Mya arenaria*), by Osgood R. Smith, 11 pp., illus., processed, June 1955.

SSR-Fish. No. 160 - Tests of Hatchery Foods for Salmon, 1953 and 1954, by Bobby D. Combs, David D. Palmer, John H. Finucane, and Roger E. Burrows, 9 pp., processed, August 1955.

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.

"Aircraft Technique for Beach Landing Craft," by J. Anthony Hind, article, International Fish and Other Food Journal, vol. 3, no. 2, 1955, pp. 24-25, illus., printed. International Fish and Other Food Journal, 6A Urtehaven, Copenhagen-Valby, Denmark. Fishing boats that land on open sandy beaches cannot go very far out to sea, but they are able to fish in coastal waters up to a distance of 20 nautical miles from shore efficiently. The

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disadvantages of normal methods of beach landing are presented. The Estlander method of beaching a fishing boat is described and illustrated; this method utilizes the boat's own winch to pull it up on to the beach along an outstretched line which is anchored at both ends, one on the shore and the other in the sea at a suitable distance from the beach. The article also describes a light-weight 30-foot motor fishing boat with retractable landing gear complete with rubber wheels. This type of craft is reported to be practical for areas where the fishing craft must land on the beach due to the lack of suitable harbors and docks.

L'Amenagement des Eaux Douces et la Recherche Piscicole, by R. Vibert, 51 pp., illus., printed in French. Conseil Superieur de la Peche, 1, Avenue de Lowendal, Paris, France.

"Bar Clam Resources," article, Trade News, vol. 8, no. 3, September 1955, pp. 8-10, illus., printed. Department of Fisheries, Ottawa, Canada. Describes a survey of the bar clam or sea clam (*Spisula solidissima*) resources of Canada's Maritime Provinces. Considering the quantities of clams obtained by dredging and the prevailing prices of bar clams, and comparing these with returns from other types of fishing where boats and gear of similar cost are involved, it was concluded that the deep-water bar clam beds on the coast cannot be profitably fished by hydraulic dredges. Bar clams can be produced at low cost, however, by manual collection (hand digging) during spring tides from the lowest parts of the intertidal beaches. This is by no means an insignificant resource because the areas that could be exploited are vast. They do have, however, the disadvantage of intermittent accessibility. Collection is possible for only three or four days every two weeks. When market demand for bar clams is heavy this disadvantage should not be serious enough to prevent the development of the resource. In many areas processors handle several kinds of fish products more or less simultaneously and fishermen are interested in part-time employment. In such places the bar clam could be more widely used to provide a welcome increase in income to the inshore fishermen and the processor.

Biennial Report, 1953-1954, Publication No. 2, 83 pp., illus., printed. Marine Biological Laboratory, University of Delaware, Newark and Lewes, Del., December 1954. This report covers the work of the Marine Laboratory in the calendar years 1953 and 1954 and describes the major projects and presents their objectives, activities, and accomplishments. The report covers the eight projects in progress or completed during the biennium: included are studies on the basic biology of the sea trout (weakfish); commercial trawl fishing in Delaware Bay; a fisheries statistical program, including both the commercial and sport fisheries; the plankton and hydrographic features of the bay; blue crab and oyster studies. The report also has a section on the teaching of Marine Biology at the University.

Bulletin de L'Institut International du Froid (Bulletin of the International Institute of Refrigeration), Numero Special IX^e Congres International du Froid, vol. XXXV, no. 4, pp. 656-1002, illus.,

printed in English and French. Institut International du Froid, 177 Boulevard Maiesherbes, Paris 17, France, 1955. A special issue containing papers presented at the International Congress of Refrigeration on problems relating to refrigeration.

Bulletin de L'Institut des Peches Maritimes du Maroc, No. 2, 81 pp., illus., printed in French. Institut des Peches Maritimes du Maroc, Casa-blanca, Morocco, December 1954. Contains the following articles: "Les Merlus du Maroc et Leur Peche," by Claude Maurin; and "Le Cerveau de *Merluccius merluccius* (L.) et de *Merluccius senegalensis cadenat*," by W. Geiger.

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 5, no. 4, 78 pp., illus., printed in Japanese with summaries in English. Hakodate, Japan, February 1955. Contains among others the following scientific papers: "An Experimental Study for Estimating the Approximate Amount of Fish Shoals by Echo Sounding Method;" "Studies in the Bacteriological Chemistry of Shark Muscle Spoilage. I. On the Changes of Urease-Activity and Bacterial Flora During Shark Muscle Spoilage;" "Mechanical Studies of Fishing Net Materials. III. Some Information on the Tensile Strength of Netting Cord (2);" "Studies on the Nutritive Value of the Meat of Sea Cucumber (*Stichopus japonicus* SELENKA): I. General Introduction and Explanation of Plan of Investigations; II. Seasonal Changes of Chemical Components of the meat of *Stichopus japonicus*; III. A comparison of the Chemical Components of the Meat of Sea Cucumber with the Meat of Other Marine Animals; IV. Digestibility of Meat of Sea Cucumbers.

The Businessman's Guide to Government Information and Advice, edited by Sherman S. Cohen, 98 pp., printed, \$2. American Association for Public Information, Education and Research, Washington 5, D. C., 1955. A handy guide to government sources designed for businessmen including an annotated bibliography of publications issued by all major Government agencies. Part I of the booklet explains how to obtain information and advice from the branches and agencies of the Federal Government. Part II contains an annotated bibliography of important government publications which warrant use as a basic reference library. It represents a selection of current studies and reports in the special fields of banking and finance, domestic commerce, family affairs, foreign trade, government procurement, labor relations, public administration, small business management, and transportation. Part II identifies key personnel who are responsible for the compilation and publication of vital economic and business data.

(Canada) Department of Fisheries Twenty-Fourth Annual Report, 1953-1954, 75 pp., printed. Department of Fisheries, Ottawa, Canada. This is the 87th Annual Fisheries Report of the Government of Canada. Discusses the conservation and development service; inspection and consumer service; markets and economics service; information and educational service;

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Fishermen's Indemnity Fund; Fisheries Prices Support Board; Fisheries Research Board; international commissions; and special committees. A section of the report is devoted to a review of Canada during 1953 and statistics of the fisheries. An appendix presents the financial statements of the Department's various activities for 1953/54.

(Canada) Journal of the Fisheries Research Board of Canada, vol. XII, no. 5, illus., printed, September 1955. Fisheries Research Board of Canada, Ottawa, Canada. Contains, among others, the following articles: "Extracts and Enzymic Hydrolysates from Fish Liver and Mammalian Liver," by A. Guttman; "Note on Albumin Protein Fractions in a Sturgeon," by J. R. Dingle and W. J. Dyer; "Estimation of Recruitment and Natural Mortality Rate from Age-Composition and Catch Data in British Columbia Herring Population," by Albert L. Tester; "Atlantic Cod Populations Along the Southern Canadian Mainland as Shown by Vertebral Count Studies," by R. A. McKenzie and G. F. M. Smith; "A Comparison of Atlantic Sea Sturgeon with a New Subspecies from the Gulf of Mexico (*Acipenser oxyrhynchus de sotoi*)," by Vadim D. Vladykov; and "The Inconnu (*Stenodus leucichthys mackenziei*) in Great Slave Lake and Adjoining Waters," by W. A. Fuller.

The Commercial Fish and Fisheries of Queensland, by J. Douglas Ogilby, revised and illus., by Tom C. Marshall, printed. Fisheries Branch, Department of Harbours and Marine, Brisbane, Queensland, Australia.

Contribution to the Biology of the AHOLEHOLE (a Potential Baitfish), by Albert L. Tester and Michio Takata, Industrial Research Advisory Council Grant No. 29, Final Report, Contribution No. 38 of the Hawaii Marine Laboratory, 60 pp., illus., printed. Hawaii Marine Laboratory, University of Hawaii, Honolulu, Hawaii, June 1953.

"The Contribution of Oceanographic Research to Fisheries Science," by G. L. Kesteven, article, FAO Fisheries Bulletin, vol. VIII, no. 2, April-June 1955, pp. 67-76, illus., printed. Food and Agriculture Organization of the United Nations, Rome, Italy. (For sale by the Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) The contribution of oceanography to fisheries research, which means research in economic and technical fields as well as biological, is to be understood only in terms of the applied character of fisheries science. The author, in reviewing the implications of this statement, states that "one principal consequence should be stressed; namely, that it obliges the fisheries scientist to discriminate keenly, and frequently to scrutinize his activities to determine whether they will stand the test of their application to practical fisheries problems." A brief account is given of the role played by oceanography in assisting fisheries biology in describing fishery resources, in each of the principal divisions of its work. It discusses oceanography and its relation to the distribution, abundance, and behavior of fish, fishing operations, and fisheries science.

Des Poissons sur nos Tables, 36 pp., illus., printed in French. Comité National de Propagande pour la Consommation du Poisson, 11 Rue Anatole de la Forge, Paris XVII, France. Contains the following articles: "Un Aliment de Qualité: le Poisson," by Ch. Richet; "L'Alimentation par le Poisson," by Michel Polonovski; "La Chair du Poisson, Source de Phosphore et de Calcium Alimentaires," by Lucie Randoin; "L'Alimentation des Enfants par le Poisson," by E. Lesne; "Les Poissons Jugent les Hommes," by M. Fontaine; and "Prejuges sur le Poisson," by Pierre Delore.

Directory of Organizations and Officials Concerned with the Protection of Wildlife and other Natural Resources, by Stewart M. Brandborg, 64 pp., printed, 25 cents. National Wildlife Federation, 232 Carroll Street NW., Washington 12, D. C., July 1, 1955. This is the forty-seventh edition of this directory. It is designed as a convenient reference to sources of information of wildlife (including fisheries) and as a guide to agencies and organizations that are either directly or indirectly concerned with the perpetuation and management of wildlife resources. Public agencies of national, state, and territorial governments of the United States are listed, as well as those of neighboring nations in North and South America. Most of the nongovernment organizations within the United States having a national or statewide scope of interest are included.

Ecological Factors Related to the Distribution of BANKIA GOULDI Bartsch in Chesapeake Bay, by Rudolf S. Scheltema and R. V. Truitt, Publication 100, 31 pp., illus., printed. Chesapeake Biological Laboratory, Solomons Island, Md., May 1954.

Efficiency and Selectivity of Commercial Fishing Devices Used on the Mississippi River, by William C. Starrett and Paul G. Barnickol, 46 pp., illus., printed (Reprinted from Bulletin of the Illinois Natural History Survey, vol. 26, article 4, July 1955, pp. 321-366.) Illinois Natural History Survey, Natural Resources Bldg., Urbana, Ill. In 1944 and 1946, a fishery survey was made of the Mississippi River between Caruthersville, Missouri, and Dubuque, Iowa, under the auspices of the Technical Committee for Fisheries, a subgroup of the Upper Mississippi River Conservation Committee. This paper is a statistical analysis of the catch data relative to the efficiency and selectivity of the various commercial fishing devices used during the survey. It is believed that such an analysis could be of value to persons interested in the management of the river's commercial fishery. It was demonstrated in the survey that commercial fishing devices can be fished on a selective basis. Of the fishing devices tested, basket traps and floating trammel nets were found to be the ones most selective for commercial species. Other devices were found to be quite selective when fished for a particular species of fish. The type of fishing device, the mesh size, and the fishing site influenced the species composition of the catch. Missouri statutes no longer specify minimum size limits for any commercial fish, except catfish. Illinois and Iowa still have minimum

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size limits on certain commercial species. Analysis of data from the survey indicates that, where minimum size limits of commercial fish are necessary, sizes of fish caught can be controlled by using nets of certain mesh sizes. The use of mesh size as a means of controlling the size of fish in the commercial catches reduces the labor of complying with the law by eliminating the necessity for measuring the fish in the catches.

Estuarine Bulletin, vol. 1, no. 1, 6 pp., illus., processed. University of Delaware Marine Laboratory, Newark, Del., August 1955. The aim of this new publication is to present in a nontechnical fashion, sound factual information regarding the nature of Delaware's waters and the animals they contain. It is a semi-official organ for the University of Delaware Marine Laboratory in which its objectives and progress may be reviewed.

Extent of Herring Spawning in British Columbia Waters During 1955, by D. N. Outram, Circular No. 37, 10 pp., illus., processed. Pacific Biological Station, Fisheries Research Board of Canada, Nanaimo, British Columbia, July 1955.

Fiskeri-Beretning for Året 1954, 244 pp., illus., printed in Danish with English and French resumes. I Kommission Hos G.E.C. Gad, Kobenhavn, Denmark. This report contains detailed statistics on the Danish fisheries for the calendar year 1954. Included in the report are data on number of fishermen, number of fishing craft, value of fishing vessels, catch by species, landed value of the catch, resumes by fisheries, and imports and exports of fishery products. Also includes names of fish and shellfish in Danish, Latin, English, Swedish, German, and French.

The Food Habits of Hatchery-Produced Pond-Cultured Shad (ALOSA SAPIDISSIMA) Reared to a Length of Two Inches, by Galen H. Maxfield, Publication No. 98, 38 pp., illus., printed. Chesapeake Biological Laboratory, Solomons Island, Md., December 1953.

"Food for the Future," by J. G. Harrar, article, Science, vol. 122, no. 3164, August 19, 1955, pp. 313-316, printed, single copy 25 cents. Science, 1515 Massachusetts Ave., NW, Washington 5, D. C. This article by the Director for Agriculture, Rockefeller Foundation, New York, points out that it is the responsibility of all segments of society, not exclusively that of the scientist, to promote the wise use of natural resources. The author briefly mentions "the current interest in the sea as a gigantic and relatively untapped food resource." With increased knowledge of the sea and its resources, the food harvest from the sea can be increased enormously.

The General Agreement on Tariffs and Trade (GATT), Department of State Publication 5993, Commercial Policy Series 151, 87 pp., printed, 30 cents. Department of State, Washington, D. C. (For sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C.)

Gremio dos Armadores da Pesca da Sardinha (Relatório e Contas do Exercício de 1953 e Orçamento para 1954), 23 pp., printed in Portuguese. Lisbon, Portugal.

Gremio dos Armadores de Navios da Pesca do Bacalhau (Relatório e Contas do Exercício de 1954 e Orçamento para 1955), 32 pp., printed in Portuguese. Lisbon, Portugal.

Harvest of the Sea, by Walter Buehr, 96 pp., illus., printed, \$2.50. William Morrow & Co., Inc., 425 4th Ave., N. Y. 16, N. Y. This is a book on commercial fishing for young people.

Havsfiske (Ocean Fisheries), by Nils Rosen, pp. 304-334, illus., printed in Swedish. (Reprinted from Boken om Havet, Del III (The Book of the Ocean, Part III)). Sohlmans Forlag, Stockholm, Sweden.

"Holding Lobsters Alive," article, Trade News, vol. 8, no. 2, August 1955, pp. 3-4, illus., printed. The Department of Fisheries of Canada, Ottawa, Canada. Because lobster catches and market demands vary, it is necessary to hold live lobsters in pounds or in shops anywhere from several days to several months. Even for experienced pound operators this is a critical period. At times heavy losses may, and often do occur, because of unfavorable holding conditions. Scientists of the Fisheries Research Board of Canada at the Atlantic Biological Station, St. Andrews, N. B., have been carrying out experiments on the holding of lobsters. These scientists describe some of their conclusions in this article which is based on experiments in which over 7,000 lobsters were held under various conditions. They have determined the three most important factors to be: (1) water temperature; (2) the amount of salt in the water; and (3) the amount of oxygen dissolved in the water.

Home Freezing of Foods, Circular 527, 36 pp., illus., printed. University of Kentucky, College of Agriculture and Home Economics, Extension Division, Lexington, Ky. Directions are given for freezing and storing foods, including fish. Quick freezing is an excellent method of preservation, and if good methods and correct temperatures are used, foods will retain most of their nutritive value, natural color, flavor, and texture.

"The Homing Salmon," by Arthur D. Hasler and James A. Larsen, article, Scientific American, vol. 193, no. 2, August 1955, pp. 72-76, illus., printed, single copy 50 cents. Scientific American, 2 West 45th Street, New York 36, N. Y. This article discusses recent laboratory and field experiments which indicate that salmon find their way back to the waters of their birth by means of a remarkably refined sense of smell.

How the Bureau of Foreign Commerce Works for You, 28 pp., illus., printed. U. S. Department of Commerce, Washington 25, D. C. This booklet explains what the Bureau of Foreign Commerce does to foster, promote, and develop international trade; describes the many different

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types of consultative and information services available to United States businessmen through the Bureau and the Department's 33 field offices.

Industrial and Manufacturing Chemistry, \$50.

Part I. Organic (A Practical Treatise), by Geoffrey Martin (Seventh Edition revised by Edward I. Cooke), 773 pp., illus., printed. Part II. Inorganic (in two volumes), by Geoffrey Martin (Sixth Edition revised by Wilfrid Francis), vol. I, 623 pp., and vol. II, 512 pp.; illus., printed. Philosophical Library, Inc., 15 E. 40th St., New York 16, N. Y., 1955. These books are a treatise on the applications of Organic and Inorganic Chemistry to the arts and manufacturers. They deal both with British and American practice and contain as much up-to-date information as available regarding the various branches of the chemical industry and of manufacturers having a chemical basis. Statistics are made a feature of these works. Not only main industries have been covered, but minor industries and new and unusual processes and products are also included. The profitable utilization of byproducts has received special consideration. Of particular interest to the fishing and allied industries are the references in Part I to quick smoking, fish bladder glues, fish glues, agar-agar gelatine, Irish moss gelatine, and fish oils. On fish oils, the author includes data on bleaching, constants, deodorizing, hydrogenation, and iodine values. A reference to fish stearine and fish tallow is also made. Part II, which is a continuation or supplement to Part I, contains sections dealing with salt for the fishing industry, freezing mixtures, ice-making machines, iodine from sea weed, algin, amino acids, composition of brine, purification of brine, fish scrap, fish manures, and fish guanos. All of the books in this series contain full literary references prefixed to each article and all are fully indexed. For those engaged in any type of research which involves organic or inorganic chemistry, these books are an invaluable source of information. For those interested in new processes or in learning about new industries, these books would be of considerable help.

--J. Pileggi

(International North Pacific Fisheries Commission) Bulletin No. 1, 140 pp., illus., printed. International North Pacific Fisheries Commission, Vancouver, B. C., Canada, June 1955. In 1954, the International North Pacific Fisheries Commission established a Committee on Biology and Research for the purpose of (a) reviewing existing knowledge of the North Pacific fisheries, (b) determining what further knowledge is necessary, and (c) recommending a research program designed to obtain that knowledge. The Commission will periodically publish reports on scientific investigations which are related to its interests. This bulletin, the first of a publication series, presents material which will provide general perspective and background for succeeding papers dealing with more detailed aspects. The documentation prepared by and for the Committee on Biology and Research was intended to serve this purpose of orientation. The following papers, appearing in this bulletin, were therefore published not as original research material, but rather as a symposium on biological, eco-

logical, and industrial factors characterizing those fisheries of the North Pacific area of primary, immediate interest to the Commission: (1) "The Pacific Salmon (*Genus oncorhynchus*) of the Canadian Pacific Coast, with Particular Reference to their Occurrence in or Near Fresh Water," by R. E. Foerster; (2) "On the Salmon in Waters Adjacent to Japan--A Biological Review;" (3) "A Brief Review of the Salmon Fishery in the Aleutian Islands Area," by C. E. Atkinson; (4) "The Pacific Herring (*Clupea pallasii*) along the Pacific Coast of Canada," by F. H. C. Taylor; and (5) "Oceanography along the Canadian Pacific Coast," by J. P. Tully.

(International Commission for the Northwest Atlantic Fisheries) Statistical Bulletin for the Year 1953, vol. 3, 56 pp., illus., printed. International Commission for the Northwest Atlantic Fisheries, Halifax, N. S., Canada, 1955. This bulletin is divided into three parts as follows: Part 1 deals with the development of the fisheries in the Convention Area over a series of years. It includes figures on landings by species and sub-areas and trends of landings by countries. It also includes a list of species of fish with their scientific names and the common names used in the participating countries. Part 2 gives the statistics, for the calendar year 1953, of landings (converted to round, fresh fish) and fishing-effort data. In particular cases yields per unit of effort are also given. Part 3 contains corrections and amendments to the statistics published in the earlier volumes.

A Key to the Commercial and Potentially Commercial Shrimp of the Family PENAEIDAE of the Western North Atlantic and the Gulf of Mexico, by Gilbert L. Voss, Technical Series No. 14, 23 pp., illus., printed. State Board of Conservation, Tallahassee, Fla., May 1955. This paper presents illustrations of 19 species of commercial shrimp of the Western North Atlantic and the Gulf of Mexico and a key that should be of use to the field worker and fisherman, as well as the scientist, in the identification of shrimp. The author has attempted to illustrate the carapace and rostrum of all of the species in the key. In order that this paper may be more useful to those nonspecialists interested in learning more about shrimp systematics and morphology, a selected bibliography has been added, in which are found most of the original references to the species in the key, works pertinent to the area, and one or two general reference works consulted during the course of this study.

La Soberania Maritima del Peru (Defensa de las 200 millas de mar peruano ante las recientes transgresiones), by Enrique Garcia Sayan, 64 pp., illus., printed in Spanish. Talleres Graficos P. L. Villanueva, S. A., Lampa 277, Lima, Peru, 1955.

(Maryland) Annual Report, 1953, Department of Research and Education, by R. V. Truitt, Educational Series No. 34, 30 pp., illus., printed. (Reprinted from Tenth Annual Report, Maryland Board of Natural Resources, 1953.) Chesapeake Biological Laboratory, Maryland Department of Research and Education, Solomons Island,

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Maryland. Discusses the work of the Maryland Department of Research and Education and its Chesapeake Biological Laboratory on fish research and statistics, hatcheries, oysters, crabs, marine fouling, hydrography, and ecology of Chincoteague Bay.

Maryland Commercial Fish Hatchery Operations, 1952-1953, by Earl T. Walker and T. Harvey Mister, Educational Series No. 35, 8 pp., illus., printed. Chesapeake Biological Laboratory, Solomons Island, Md., February 1954.

Maryland Commercial Fisheries Statistics, 1951-1952, by Harry A. Hensel and Richard E. Tiller, Publication No. 99, 28 pp. (mostly tables), illus., printed. Chesapeake Biological Laboratory, Solomons Island, Md., May 1954.

Maryland Commercial Fishing Gears III. The Crab Gears, by David G. Cargo, Educational Series No. 36, 18 pp., illus., printed. Board of Natural Resources, Department of Research and Education, Solomons Island, Md., April 1954. Briefly describes the various types of gear used to capture blue crabs commercially. The four major units employed in the Maryland portion of Chesapeake Bay are: (1) trotline; (2) pot; (3) scrape; and (4) dip net. An additional four units are prohibited by law in Maryland or are employed so seldom as to be of little consequence: the dredge, the fyke, the haul seine, and the push net.

Maryland's Living Waters, by Byron L. Ashbaugh and Paul W. McKee, Educational Series No. 37, 22 pp., illus., printed. Board of Natural Resources, Department of Research and Education, Solomons Island, Md., May 1954.

Maryland Natural Resource Bibliography (A guide to key works dealing with the Zoology, Botany, Geology and related subjects), by Romeo Mansueti, Resource Study Report No. 7, 27 pp., illus., printed. Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons Island, Md. The purpose of this bibliography is: (1) to list the most important and comprehensive references dealing with specific natural resources (including fisheries) in the Maryland region so that any interested person can name, classify, or obtain information pertaining to the various animals, plants, minerals, and related natural resources; (2) to trace bibliographically the rise and progress of the study of various fields of natural history and related subjects in the Maryland region; (3) to show bibliographically the respective roles played by the various institutions and individuals in the development and increase in knowledge of Maryland zoology, botany, geology, paleontology, archaeology, and related subjects; (4) to suggest fields of study in Maryland natural resources that are as yet unexplored if references can indicate in general the status of knowledge of each subject.

NFBA Directory of Members, 190 pp., printed. National Food Brokers Association, Washington, D. C., August 1955. Lists the leading food brokers and included are brokers of canned, frozen, and other fishery products.

"New Echo-Sounding Methods at Bear Island," article, World Fishing, vol. 4, no. 10, October 1955, pp. 18-21, illus., printed, single copy 2s. 6d. (35 US cents). John Trundell Ltd., Temple Chambers, Temple Ave., London, E.C. 4. The Ernest Holt, the distant-water research vessel of the British Ministry of Agriculture, Fisheries and Food, confirmed that echo-sounding even in deep water is on the way to giving a real estimate of the possible catch: it might be nil, or 10 baskets, or 30 baskets. By taking the trouble to watch the cathode-ray tube continuously and noting the number of minutes when good fish echoes were showing during a tow, it was possible to say how many baskets of cod there would be in the cod end; that is, when all went well. There were a few snags, and in order to adopt the Ernest Holt's present methods in a fishing vessel, two extra operators would have to be carried. A well-known type of echo-sounder with a cathode-ray tube presentation was used throughout.

"The New South Wales Trawlfishery: Review of Past Course and Examination of Present Condition," by T. W. Houston, article, Australian Journal of Marine and Freshwater Research, vol. 6, no. 2, August 1955, pp. 165-208, illus., printed, single copy 7s. 6d. (84 U.S. cents). Commonwealth Scientific and Industrial Research Organization, 314 Albert Street, East Melbourne, C. 2, Victoria, Australia.

(New Zealand) Annual Report of the Marine Department (1 April 1954 to 31 March 1955), 63 pp., printed. Marine Department, Wellington, New Zealand, 1955. Among others, the report contains a section on the fisheries of New Zealand which discusses crayfish, fishing vessels and personnel, fish landings, methods of capture, landings by ports, exports and imports, whaling, oysters, whitebait, mussels, fresh-water fisheries and research, marine research, and legislation. The section concludes with a series of tables giving detailed data on the fisheries.

Norges Fiskerier, 1952 (Fisheries Statistics of Norway), Norges Offisielle Statistikk Series XI, no. 205, 110 pp., illus., printed in Norwegian with a table of contents also in English, Kr. 3.50 net (50 U. S. cents). Fiskeridirektoren, Bergen, Norway, 1955. (Printed by H. Aschehoug & Co., Oslo, Norway.) Contains the official annual fisheries statistics of Norway by districts. Includes quantity, value, and average prices for all species of fish caught commercially. Also gives statistics on number of fishermen and craft, and number and type of gear, as well as data on fish-processing plants. Information on utilization of catch and on participation by men and craft is also given for the most important sections of the fishing industry. 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, crustaceans, and mollusks; and drawings of the different types of fishing gear.

The Ocean Fishery (Massachusetts' Oldest Industry), 28 pp., illus., printed. Department of Natural Resources, Division of Marine Fisheries, 15 Ashburton Place, Boston, Mass. A brief but

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comprehensive sketch of the oldest industry in Massachusetts, which has remained a vital asset to her coastal communities. The booklet begins by describing the early days of the fishing industry, the bank fishermen, and whaling. In discussing the industry and methods of today, the various types of fishing and fisheries are described. A section of the booklet is devoted to recent developments and the future of the industry.

Open Boat Whaling in the Azores (The History and Present Methods of a Relic Industry), by Robert Clarke, "Discovery Reports," vol. XXVI, pp. 281-354, plates XIII-XVIII, printed, single copy 21s. (US\$2.95). Cambridge University Press American Branch, 32 East 57th Street, New York 22, N. Y., 1954. The report has a historical and a technical section. To these are appended a few notes on Madeiran whaling. The historical section falls naturally into two parts: the first describes the role of the Azores and their inhabitants in the pelagic sperm-whaling industry which the New Englanders inspired and monopolized during the eighteenth and nineteenth centuries; the second part traces from these whaling days the emergence and subsequent fortunes of the shore whale fishery up to the existing fishery and employs throughout comparisons with old-time American whaling. The cliff lookouts, the whaleboat and its gear and employment, the motor towboat, whale hunting, modern stations, ambergris, scrimshaw, and sperm leather are all described and discussed. The most recent statistics appearing in the study are for 1949. "Discovery Reports" are issued by the National Institute of Oceanography.

"Poisson et Crustace Congeles," by F. Bramsneas, article, Annexe 1955-1, Supplement au Bulletin de l'Institut International du Froid (Bulletin of the International Institute of Refrigeration), Commissions 4 and 5, Madrid (Espagne), May 31-June 5, 1954, pp. 83-99, printed in French with summary in English. Institute International du Froid, 177 Boulevard Malesherbes, Paris 17, France. The author states that "The alterations of quality that take place in frozen fish were earlier explained by the theory of the disruption of cell tissue. Quick freezing became the slogan at that time. It has, however, later been shown through profound organoleptic investigations that the freezing itself plays a minor role, while the conditions of subsequent storage, i.e., temperature and time, are of the utmost importance. The quality of the frozen fillet is highly dependent on the freshness of the raw material as illustrated by the well-known Norwegian freezing experiments with cod. The problem of freezing on board the fishing vessel is of interest in this connection. Frozen fillets produced from wet fish of high quality are to be preferred. Production of fillets from frozen whole fish is, however, probably of interest in regions where only several-days-iced wet fish are available. A number of freezing plants dip the wet fillets in brine before freezing in order to reduce the drip loss. The brine procedure, however, impairs the quality in other directions. Among the number of antioxidants so far only ascorbic acid, although expensive, seems recom-

mendable, especially for the freezing of fat fish. The common freezing procedure, besides contact freezing, is tunnel freezing. The speed of the air should be about 5-12 meters (16-39 feet) per second, i.e., greater than thought earlier. It is important that the entire cross section of the tunnel is filled up with goods, during freezing operation. Freezing through liquid contact is not yet a widespread practice, apart from the inexpensive brine freezing of boxes with herring known from Norway. The implication of effective packing is mentioned. Even slight drying up of the surface of the fish means an increased rate of rancidity. This may happen when a carton is not filled up completely, even though the wrapping material may be airtight. A good water ice is still the cheapest and most effective wrapper. The effect of the ice is prolonged if the goods are stored in a jacketed cold-storage room. Freezing of crustaceans meets with particular difficulties, such as early dehydration and color changes. In this case tight wrapping and low temperatures are essential. A lowering of the storage temperature of 5-10°C. doubles the possible storage period for frozen fish products in general. There is a definite tendency to lower storage temperatures in new cold-storage plants in Europe and the United States. Low temperatures are particularly important when the fish is intended for subsequent canning as shown in experiments in the canning of sprat in Norway. Impaired quality in frozen storage is due, apart from rancidity, mainly to the denaturation of the protein matter. The cause of the denaturation cannot yet be fully explained, but it has been followed experimentally and proved to depend a great deal on the storage temperature."

Problems of Ocean Fisheries (Report to the Legislature Pursuant to House Resolution No. 150--1953), Assembly Interim Committee Reports 1953-1955, vol. 5, no. 1, 21 pp., printed. Assembly of the State of California, Sacramento 14, Calif., March 1955. This report is directed to a study of the conditions and regulatory needs for the protection and conservation of certain ocean fisheries as embraced by proposed legislation in Assembly Bills Nos. 597 and 1734, and Senate Bill No. 264 presented at the 1953 Session of the Legislature. It also includes special study and recommendations covering the yellowtail, sardine, and anchovy problems.

Progress Reports of the Atlantic Coast Stations, no. 62, 43 pp., illus., printed, in English and French. Fisheries Research Board of Canada, Atlantic Biological Station, St. Andrews, N. B.

Progress Report on the Development of the British Columbia Mid-Water Trawl for Herring, by W. E. Barraclough and W. W. Johnson, Circular No. 36, 25 pp., illus., processed. Pacific Biological Station, Fisheries Research Board of Canada, Nanaimo, B. C., March 1955. This outline of the history of mid-water trawling in British Columbia describes and dates a number of recent experiments. Preliminary results found the net very effective at night, as the herring were rising off the bottom and at the period before daybreak as they were descending to the bottom. Catches of 20 to 30

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tons of herring were made on six different tows at night. Catches during the day averaged much lighter. One catch of an estimated 100 tons burst the net upon surfacing. The net has a 40-foot square mouth opening with four quarter wings, and a length of 175 feet over-all from the wing to the cod end. Graduated sizes of nylon mesh were used, varying from 5, 4½, and 3 inches in the wings and body, to 1¼-inch mesh in the cod end. Detailed patterns and instructions for net fabrication are included. The net is equipped with trawl-plane floats on the headrope and depressors are attached to the two lower wings. The four bridle lines are of ¾-inch wire rope and those attached to the headrope and footrope wings were 31 and 30 feet long, respectively. At the two points dualfin otter boards are attached on 10-fathom pennant lines. Towing warps were of conventional wire rope from a double-drum-stern-set trawler. Detailed descriptions for building depressors and dualfin otter doors as well as instructions on governing the fishing depth of the trawl and methods of brailing the catch are included.

--J. L. Squire, Jr.

Proposed Trade Practice Rules for the Frozen Food Industry, 13 pp., printed. Federal Trade Commission, Washington 25, D. C.

Public Notice of Investigation and Hearings, Investigation No. 4 under Section 3 of the Trade Agreements Extension Act of 1951, as Amended, and Section 332 of the Tariff Act of 1930, with Respect to Articles Listed for Consideration in Proposed Trade Agreement Negotiations with Contracting Parties of GATT, 5 pp., processed. United States Tariff Commission, Washington 25, D. C., September 21, 1955.

"The Quick-Freezing of Fish Discussed by Fourteen Countries," by E. W. McCabe, article, Modern Refrigeration, vol. LVIII, no. 688, July 1955, pp. 231-234, illus., printed, single copy 2s. 6d. (about 34 U. S. cents). Modern Refrigeration, Terminal House, 52 Grosvenor Gardens, London, S. W. 1, England. Sixty delegates from fourteen countries--Austria, Belgium, Canada, Denmark, France, W. Germany, Great Britain, Greece, Holland, Iceland, Ireland, Italy, Norway, and Sweden--recently attended a "workshop" arranged by the office of European Economic Cooperation in Kiel, Germany. Its object was the pooling of technical and commercial knowledge which has been gained up to the present in the technique of improving quality and packing of quick-frozen fish which so greatly affects the fishing industry of all Europe. Summaries are given of the papers which were presented at the workshop and the discussions which followed the presentation of the papers.

"A Rapid Method for the Determination of Moisture Content in Fish Meat," by Yasuhiko Tsuchiya and Tomo Nakano, article, Tohoku Journal of Agricultural Research, vol. V, no. 2, December 1954, pp. 93-97, illus., printed. Faculty of Agriculture, Tohoku University, Sendai, Japan.

Regulation and Investigation of the Pacific Halibut Fishery in 1954, Report of the International

Pacific Halibut Commission No. 22, 33 pp., illus., printed. International Pacific Halibut Commission, Seattle, Washington, 1955. A brief review of the Commission's activities during 1954 with reference to the preservation of the halibut fishery of the Northern Pacific Ocean and Bering Sea. In 1954 the Commission continued the regulation of the halibut fishery and the statistical and biological investigations that form the basis for current and the historical background of the convention between Canada and the United States for the preservation of the Northern Pacific halibut fishery, the 1954 regulations, statistics of the fishery, the fishery in special areas, catch per unit of fishing effort, composition of catches, and tagging operations 1954.

Rehabilitation and Development of Agriculture, Forestry and Fisheries in South Korea (Report prepared for the United Nations Korean Reconstruction Agency by a Mission Selected by the Food and Agriculture Organization of the United Nations), \$8.75. Columbia University Press, New York, N. Y.

"Retaining the Quality of Fishery Products," by Charles Butler, article, Industrial Refrigeration, vol. 129, no. 3, September 1955, pp. 18-19, printed, single copy 25 cents. Nickerson & Collins Co., 433 N. Waller Ave., Chicago 44, Ill.

"Seafood Canning Plant," by Claude Gresham, article, Louisiana Conservationist, vol. 7, no. 10, September 1955, pp. 11-13, illus., printed. Louisiana Wild Life and Fisheries Commission, 126 Civil Courts Bldg., New Orleans, La. Louisiana seafood is well-known throughout the nation, and this pleasing notoriety is due primarily to the oysters and shrimp which leave the State in cans. One of the largest of the seafood canning plants in Louisiana is located in Harvey, just across the Mississippi River from New Orleans. This article gives a glimpse into the operations of this company at a time when they were canning oysters. A series of pictures portrays the processing steps for oysters from the time they are unloaded from the luggers through all the processes until the cans are placed in railroad cars for national distribution.

The Sea Nettle, Chesapeake Bay's Troublesome Summer Jellyfish, by R. Mansueti, 2 pp., illus., printed. (Reprinted from Maryland Tidewater News, vol. 12, no. 3, supplement no. 7, August 1955.) Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons Island, Md.

"Small Boat and Gear Insurance for Canadian Fishermen," by I. S. McArthur, article FAO Fisheries Bulletin, vol. VIII, no. 2, April-June 1955, pp. 77-85, printed. Food and Agriculture Organization of the United Nations, Rome, Italy. (For sale by the Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) Describes a detailed study of the problems of small-boat and gear insurance for Canadian fishermen. All possible data were secured on loss experience over a period of years, and fishermen and

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fishermen's groups were interviewed to determine the attitude of fishermen and the extent to which they would be willing and able to contribute in the way of annual premiums. Vessel and lobster-trap insurance plans and a general description of their operation are presented. The lobster-trap plan has proved to be much more difficult to administer than the vessel scheme, particularly because losses occur a few at a time over an extended period. Since these losses are frequently replaced during the season, it is necessary to insure that the records are at all times complete and that premiums are paid on the traps replacing those lost. Considerable pressure has been brought to bear to extend the insurance plan to other types of fishing equipment, such as nets, weirs, etc. But from the experience gained with the lobster-trap plan, it is obvious that any attempt to insure fishing gear generally would be very difficult indeed. Most types of fishing gear, especially nets, wear out in two or three years and the constant repair of such gear would make it almost impossible to identify the item insured.

Shrimp and Prawn Prospecting on the British Columbia Coast, June to December 1954, by T. H. Butler and G. V. Dubokovic, Circular No. 35, 92 pp., illus., processed, Pacific Biological Station, Fisheries Research Board of Canada, Nanaimo, B. C., February 1955. Describes the 1954 progress in the exploratory fishing program to find new shrimp grounds off the British Columbia coast. Fishing was conducted with small otter trawls and traps by the contract trawler Yuri M. Exploratory fishing was conducted off the west coast of Vancouver Island, in Georgia Strait, Juan de Fuca Strait, and along the Northern British Columbia coast. Shrimp of the "smooth pink" (*Pandalus jordani*) and "side-stripe" type (*Pandalus dispai*) were taken in commercial quantities by trawl in the Barkley Sound area. Trawling in Northern British Columbia's Chatham Sound produced shrimp in possible commercial quantities. Trawling in other areas either resulted in negative results or quantities caught were not of commercial size. Prawn trapping yielded possible commercial quantities in two localities in Georgia Strait and Juan de Fuca Strait. Results with prawn traps were not promising along the northern British Columbia coast and only a small portion of the suitable ground was explored off the west coast of Vancouver Island. Detailed drawings of prawn trap construction and complete log and maps of all fishing activity are included.

--J. L. Squire, Jr.

A Study of the Maryland Tidewater Sport Fishery, by R. D. Buzzell and E. T. Walker, Resource

Study Report No. 4, 19 pp., illus printed Maryland Department of Research and Education, Solomons Island, Md.

Studies on Ecdysis in the American Lobster (HOMARUS AMERICANUS) 4. Estrogenic Hormone as a Possible Moulting-Inhibitor in the Egg-Bearing Female, by J. Kenneth Donahue, Research Bulletin No. 24, 6 pp., printed. Department of Sea and Shore Fisheries, Vickery-Hill Building, Augusta, Maine, August, 1955.

"Study Reveals More Facts on Commercial Fishing," by William R. Dryer, article, The Tennessee Conservationist, vol. XXI, no. 8, August 1955, p. 1, illus., printed. Tennessee Department of Conservation and the Tennessee Game and Fish Commission, Editorial Office, 233 Cordell Hull Bldg., Nashville, Tenn. This study of commercial fishing activities in Tennessee waters was undertaken by the State Game and Fish Commission to iron out difficulties arising between commercial fishermen, sport fishermen, and fish dealers. The study brings out some interesting facts of value to state regulatory agencies faced with the continual conflict between commercial and sports fishermen. The commercial fisheries of Tennessee are estimated to be worth \$2.5 million annually and include 2 million pounds of catfish for the year ending June 30, 1954. Complaints of the parties involved are considered, with some suggestions as to ways and means of resolving these conflicts.

The UNESCO Courier, vol. VIII, no. 3, August 1955, 36 pp., illus., printed, 25 cents per copy. United Nations Educational Scientific and Cultural Organization, Publications Service, 475 Fifth Ave., New York 17, N. Y. Describes the international and national efforts to exploit new marine resources and the latest developments in oceanographic research. Other articles tell about "Hunting the Whale," "Migrating Mammoths," "Bread from the Sea," "Strange Facts about Neptune's Realm," and "Fish in Myth and Legend."

Watch for the Green Crab--A New Clam Enemy, by J. C. Medcof and L. M. Dickie, General Series Circular No. 26, 1 p., illus., printed. Fisheries Research Board of Canada, Atlantic Biological Station, St. Andrews, N. B., July 1955.

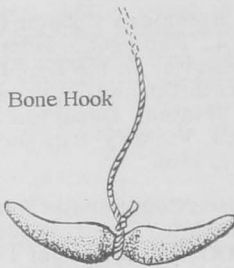
World Population and World Food Supplies, by Edward John Russell, 516 pp., illus., printed. George Allen & Unwin Ltd., Ruskin House Museum Street, London, England. Among the subjects discussed are fish consumption and fish culture.



ICE FISHING IN MICHIGAN

The Indians were the fellows who started this business of ice fishing in Michigan, long before Columbus, long before the time of steel hooks.

They used spears, bows and arrows, and a kind of stone or bone hook called a gorge. Bait was placed on the gorge and the fish was allowed to swallow it. When the line was pulled, the gorge turned sideways inside the fish and served as a fairly efficient anchor inside the fish's gullet.



The tip-up became popular with Indians on Keweenaw Bay more than 100 years ago, the first ones being made of bent twigs. About this time too, the red man was hauling lake trout to the shores of the Straits of Mackinac in a dog sled and this still was long before the white man thought of the practicality or enjoyment of this sport.

As we know it today, ice fishing had its beginning in the early thirties, near Coldwater in Branch County. Here a few hardy individuals discovered they could catch bluegills through the ice. This was the start, and caused the growth of ice fishing to its present place of popularity. In two decades it has become a major factor in Michigan's conservation and tourist work.

For every fisherman who 20 years ago enjoyed catching bluegills through the ice, there are now several thousand waiting for the big freeze each fall to pursue their favorite cold-weather pastime. Their windbreaks, tip-ups, and shanties are found everywhere on Michigan waters in the winter. They are out for bluegills, perch, smelt, northern pike, walleyes, lake trout, crappies, whitefish, sturgeon, and a variety of pan fish, with women constituting a high percentage of the total number of anglers.

--Michigan Conservation,
January-February 1955.

WHAT ARE MINNOWS?

Any small fish may be loosely designated as a "minnow" or "minnie." The word minnow undoubtedly is derived from the Latin "minutus," meaning small. A better general term for the young of fish is "fry." Actually, "minnows" should be properly applied only to the family Cyprinidae, which includes the carp and goldfish, as well as the true minnows. Oddly enough, this minnow family includes a species which grows to a length of 5 feet and a weight of 80 pounds. This is the "white salmon" of the Colorado River Basin, Ptychocheilus lucius. Another group of fish is the "top minnow," which includes the famous Gambusia, planted widely to combat mosquitoes. Gambusia, or mosquitofish as it is more commonly called, feeds on the larvae of mosquitoes and in this way keeps down the numbers of these pests.

--Sea Secrets, June 6, 1954,
University of Miami Marine Laboratory,
Coral Gables, Fla.