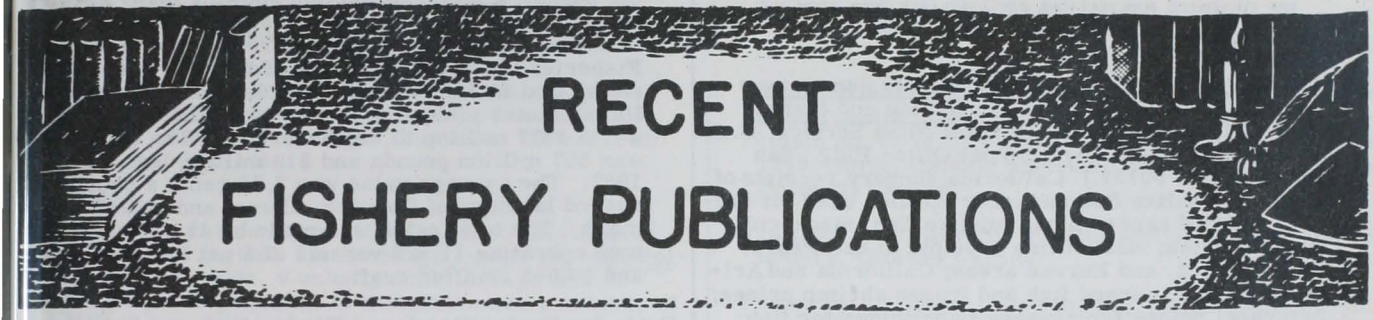

FISH AND WILDLIFE SERVICE PUBLICATIONS

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CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
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SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
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Number	Title
CFS-3848	Frozen Fishery Products, June 1965, 8 pp.
CFS-3855	Michigan, Ohio & Wisconsin Landings, March 1965, 4 pp.
CFS-3865	New Jersey Landings, May 1965, 3 pp.
CFS-3867	Fish Sticks, Fish Portions, and Breaded Shrimp, April-June 1965, 3 pp.
CFS-3869	Maryland Landings, April 1965, 4 pp.
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CFS-3881	Louisiana Landings, May 1965, 3 pp.
CFS-3885	Florida Landings, June 1965, 8 pp.

SL-10 - Wholesale Dealers in Fishery Products, Maryland, 1964 (Revised), 9 pp.

Firms Canning Fishery Products, 1964 (Revised):
SL-102A - Pacific Sardines, 1 p.
SL-103 - Tuna, 2 pp.
SL-103A - Tunalike Fishes, 1 p.
SL-104 - Mackerel, 1 p.
SL-105 - Alewives, 1 p.
SL-106 - Shad, 1 p.
SL-110 - Oysters, 2 pp.
SL-118 - Groundfish Flakes, 1 p.
SL-119 - Squid, 1 p.
SL-120 - Anchovies, 1 p.

Sep. No. 742 - Pasteurization of Fishery Products with Gamma Rays from a Cobalt-60 Source.

Sep. No. 743 - Construction and Operation of the "Cobb" Pelagic Trawl (1964).

FL-578 - Haddock, by Albert C. Jensen, 7 pp., illus., June 1965. Covers the occurrence and commercial value of the haddock (Melanogrammus aeglefinus), and its spawning and early life, growth, age determination, commercial otter-trawl fishery, market utilization, and biological research.

SSR-Fish. No. 509 - Laboratory Evaluation of the 1-on-10 Slope Ice Harbor Fishway Design, by Clark S. Thompson and Joseph R. Gauley, 23 pp., illus., June 1965.

SSR-Fish. No. 511 - Evaluation of Biological Stains, Inks, and Fluorescent Pigments as Marks for Shrimp, by Edward F. Klima, 8 pp., illus., May 1965.

SSR-Fish. No. 512 - Hypotheses on the Origin of Exploited Skipjack Tuna (Katsuwonus pelamis) in the Eastern and Central Pacific Ocean, by Brian J. Rothschild, 20 pp., illus., April 1965.

SSR-Fish, No. 519 - Biological Investigations of Purse Seine Fishery for Atlantic Menhaden, by Kenneth A. Henry, 15 pp., illus., July 1965. After record catches in 1961 and 1962 of about 2.3 billion pounds of menhaden (Brevoortia species), the United States catch declined to about 1.5 billion pounds in 1964. Most of the decrease was in the North and Middle Atlantic areas. This report reviews biological research on the menhaden and discusses landings by area, fishing intensity by area, drop in catch per standard vessel day and total catch, shift of fishing effort to different areas, average age of catch, and estimates of abundance.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL-23	(Supplement) Fisheries of Chile, 1964, 19 pp.
MNL-58	Republic of Korea's Fishing Industry, 1964, 14 pp.
MNL-92	(Supplement) Danish Salmon Fisheries in Greenland, 1964, 5 pp.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE ICHTHYOLIGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, U. S. NATIONAL MUSEUM, WASHINGTON, D. C. 20560.

Preliminary Data on the Work with the Mid-Water Depressor Trawl in the Waters of the Southern Hemisphere, by A. P. Andriashev and U. E. Permitin, 2 pp., Translation No. 35, processed. (Translated from the Russian, Bulletin Soviet Antarctic Expedition, no. 3, 1958, pp. 69-70.)

The Systematic Position of the Black Sea Mackerel (TRACHURUS), by Yu. G. Aleev, Translation No. 34, 15 pp., processed. (Translated from the Russian, Voprosy Ikhtiologii, no. 7, 1956, pp. 174-184.)

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

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, July 1965, 15 pp., (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, July 1965, 12 pp., illus. (U. S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

New England Fisheries--Monthly Summary, June 1965, 22 pp., (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--July 1965, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, 346 Broadway, New York, N. Y. 10013.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

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Fishery Statistics of the United States, 1963, by Charles H. Lyles, Statistical Digest 57, 524 pp., illus., processed, 1965, $2.25. As in previous years, this edition of the Statistical Digest contains a review of the overall United States fishing industry; and sections on the fisheries of New England, the Middle Atlantic, Chesapeake, South Atlantic, Gulf, Pacific Coast, Great Lakes, Mississippi River, and Hawaii. This edition also contains a section on the Puerto Rican fisheries. As usual, it gives a statistical review of the fisheries for cod, haddock, halibut, salmon, sardines, mackerel, tuna, menhaden, crab, oyster, shrimp, and otter trawl-caught species. In conclusion, it presents historical fishery statistics, 1873-1963; the statistical procedures used in preparing the Digest; a pictorial section showing many species of finfish and shellfish; and a list of statistical publications issued by the U. S. Bureau of Commercial Fisheries for 1963. Analysis of the data presented shows that in 1963 the commercial fisheries of the United States yielded a catch of 4.8 billion pounds worth $377 million to the fishermen. The quantity was 507 million pounds and $19 million less than in 1962. The average value was 7.78 cents a pound; record landings of flounder, clams, and crabs were made. The total catch was made by 128,470 fishermen operating 11,928 vessels of 5 net tons and over and 66,045 smaller craft.

Guide for Buying Fresh and Frozen Fish and Shellfish, Circular 214, 50 pp., printed, 1965, 25 cents. This pamphlet offers information to help consumers, food buyers, and others associated with the food trades to know more about fish and shellfish. It is a guide to when and where fishery products are available, and describes general market forms, types of containers used, purchasing criteria, and handling and storage techniques for finfish and shellfish.

Articles from Progressive Fish-Culturist, single copy 25 cents:

"Dry concentrates as complete trout foods for growth and egg production," by Arthur M. Phillips and others, vol. 26, no. 4, 1964, pp. 155-159.

"A method of immobilizing fish for collection of blood or for inoculation," by George Post, vol. 27, no. 1, 1965, p. 48, illus.

"Observations on 'bad eggs' in Columbia River fall chinook salmon," by John F. Conrad, vol. 27, no. 1, 1965, pp. 42-44.

"An underwater camera housing for shallow-water ecological studies," by John J. Poluhowich, vol. 26, no. 4, 1964, pp. 191-193.

"Research on bacterial fish diseases in the Institute of Marine Biology (Argentina)," by David A. Conroy, vol. 27, no. 2, 1965, p. 100.

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.

ACCLIMATIZATION:

"O teorii akklimatizatsii vodnykh zhivotnykh" (Theory of the acclimatization of aquatic animals), by G. L. Shkorbatov, article, Zoologicheski Zhurnal, vol. 43, no. 7, 1964, pp. 953-964, illus., printed in Russian with English summary, Redaktsiia Zoologicheskogo Zhurnala, Podsosenskii per. d.21, Moscow B-64, U.S.S.R.

ALGAE:

Articles from Bulletin of the Japanese Society of Scientific Fisheries, vol. 30. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan:

"Comparative biochemistry of carotenoids in algae. I--On carotenoids in Porphyra tenera K.," by Terushisa Katayama, May 1964, pp. 436-439.

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"Fundamental studies on the production of alginic acid. I--Investigation of determination method of alginic acid in brown algae," by Yuzo Harada, Feb. 1964, pp. 141-146.

ANCHOVY:

"Nekotorye zakonomernosti kolebanii chislennosti i eliminatsii ikrinok i lichinok Engraulis encrasicholus ponticus Alex. v usloviyakh Chernogo morya" (Patterns of variation in abundance and mortality of Engraulis encrasicholus ponticus Alex. eggs and larvae in the Black Sea), by T. V. Dekhnik, article, Trudy Sevastopol'skoi Biol. Sta. Akad. Nauk Ukr. SSR., vol. 16, 1963, pp. 340-358, printed in Russian. Four Continent Book Corp., 156 5th Ave., New York, N. Y. 10010.

BERING SEA:

"Nekotorye nauchnye predposylki dlya organizatsii beringovomorskoi nauchno-promyslovoi ekspeditsii" (Some scientific prerequisites for organizing a Bering Sea scientific fishery expedition), by P. A. Moiseev, article, Tr. Vses. Nauch. Issled. Inst. Morskogo Rybn. Khoz. Okeanogr., vol. 48, 1963, pp. 7-12, printed in Russian. Trudy Vsesoyuznogo Nauchno-Issledovatel'skogo Instituta Morskogo Rybnogo Khoziaistva i Okeanografii, Verkhn. Krasnosel'skaia No. 17, Moscow B-140, U.S.S.R.

BIOCHEMISTRY:

"Biochemical changes in catfish, tilapia, and mrigal fish during rigor mortis," by S. S. Pawar and N. G. Magar, article, Journal of Food Science, vol. 30, Jan.-Feb. 1965, pp. 121-125, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill. 61823.

CALIFORNIA:

California Fish and Game, vol. 51, no. 3, July 1965, 96 pp., illus., printed, single copy $0.75. Office of Procurement, Documents Section, P. O. Box 1612, Sacramento, Calif. 95807. Some of the articles are: "Food of the blue rockfish, Sebastodes mystinus," by Daniel W. Gotshall, J. Gary Smith, and Allen Holbert; "Intraspecific eye lens protein differences in yellowfin tuna, Thunnus albacares," by Albert C. Smith; and "Pacific mackerel, the commercial fishery, and age composition of the Southern California catch for the 1961-62, 1962-63, and 1963-64 seasons," by J. D. Messersmith and Harold Hyatt.

Statistical Report of Fresh, Canned, Cured and Manufactured Fishery Products for 1964, by E. C. Greenhood, Circular No. 39, 16 pp., printed, 1965. Biostatistical Section, Marine Resources Operations, Department of Fish and Game, Sacramento, Calif.

CANADA:

Annual Report, Department of Fisheries, 1963/64, 23 pp., printed, 1964. Department of Fisheries, Charlottetown, Prince Edward Island, Canada.

Annual Report, Department of Fisheries, 1963/64, 55 pp., printed, 1964. Department of Fisheries, Fredericton, New Brunswick, Canada.

Annual Report of the Fisheries Research Board of Canada, 1962/63, 140 pp., illus., printed, 1964. Fisheries Research Board of Canada, Ottawa, Canada.

"A Checklist of Canadian Atlantic Fishes with Keys for Identification," by W. B. Scott and M. G. Scott, Contribution no. 66 of Life Sciences, 106 pp., illus., printed, 1965. Royal Ontario Museum, University of Toronto, Toronto, Canada.

Available from Queen's Printer and Controller of Stationery, Ottawa, Canada:

Fisheries Statistics, Nova Scotia, 1963, Catalogue No. 24-205, 47 pp., illus., processed, July 1965, C$0.75.

Journal of the Fisheries Research Board of Canada, vol. 21, no. 6, December 1964, 202 pp., illus., printed, single copy C$2.25. Some of the articles are: "Sterol metabolism in the oyster (Crassostrea virginica)," by T. Tamura; "The application of gas chromatography to the identification of the sterols of scallop (Placopecten magellanicus)," by T. Wainai and others; and "Lobster (Homarus americanus) tolerance for tris buffer, sodium fluoride, and sea water extracts of various woods," by James E. Stewart and John W. Cornick.

Journal of the Fisheries Research Board of Canada, vol. 22, no. 3, May 1965, 232 pp., illus., printed, single copy C$2.25. Among the articles are: "Lysolecithinase of cod muscle," by M. Yurkowski and H. Brockerhoff; "Chalkiness in halibut in relation to muscle pH and protein denaturation," by N. Tomlinson, S. E. Geiger, and E. Dollinger; "Factors affecting stream location, and timing and intensity of entry by spawning kokanee (Oncorhynchus nerka) into an inlet of Nicola Lake, British Columbia," by H. W. Lorz and T. G. Northcote; "First transponding oceanographic buoys in the Pacific," by F. Favorite, D. Fisk, and W. J. Ingraham, Jr.; "Browning of freeze-dried fish," by H. L. A. Tarr and R. E. A. Gadd; "Zone electrophoretic comparison of muscle myogens and blood proteins of artificial hybrids of Salmonidae with their parental species," by H. Tsuyuki and Eve Roberts; "Post-spawning death of Pacific salmon: sockeye salmon (Oncorhynchus nerka) maturing and spawning in captivity; "Studies on the quality of Newfoundland cod. 11--Thaw-drip in polyphosphate-treated and untreated fillets," by Dorothy A. Chalker, W. A. MacCallum, and D. R. Idler; "Orange-red meats in sea scallops," by Neil Bourne and E. G. Bligh; and "Haematological study of the hake (Merluccius merluccius) from the southwest Atlantic," by D. A. Conroy and J. L. Rodriguez.

CAPELIN:

"Nekotorye cherty ekologii moivy (Mallotus villosus villosus Muller) Barentseva morya" (Some features of the ecology of Barents Sea capelin), by V. S. Prokhorov, article, Trudy Polyarnogo Nauch.-Issled. Proektn. Inst. Morsk. Rybn. Khoz. Okeanogr., vol. 15, 1963, pp. 163-176, printed in Russian. Poliarnii Nauchno-Issledovatel'skii i Proiktnyi Institut Morskogo Rybnogo Khoziaistva i Okeanografii im. N. M. Knipovicha, Moscow, U.S.S.R.

CARP:

"Materialy po vyrashchivaniyu molodi karpa v podgotovlennom ozere" (Rearing young carp in a fertilized lake), by V. V. Erik, article, Izv. Gos. Nauch.-Issled. Inst. Ozern. Rechn. Rybn. Khoz., vol. 55, 1963, pp. 112-114, printed in Russian with English summary.

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

Izvestiya Gosudarstvennogo Nauchno-Issledovatel'skogo Instituta Ozernogo i Rechnogo Rybnogo Khoziaistva, Leningrad, U.S.S.R.

CLAMS:
"Observations on the origin of the paralytic poison in Alaska butter clams," by Edward J. Schantz and Harris W. Magnusson, article, Journal of Protozoology, vol. 11, no. 2, 1964, pp. 239-242, printed. Society of Protozoologists, Rockefeller Institute, 66th St. and York Ave., New York, N. Y. 10021.

COD:
"Osobennosti migratsii Barentsevormorskoi nepolovozreloi treski pervogo polugoidya 1962 goda (po dannym mecheniya)" (Characteristics of the migration of Barents Sea immature cod during the first half of 1962--according to tagging data), by Yu. I. Spiridonov, article, Referativnii Zhurnal-Biologiia, 1964, Abstract No. 17138, printed in Russian. Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

Articles from Trudy Polyarnogo Nauch.-Issled. Proektn. Inst. Morsk. Rybn. Khoz. Okeanogr., vol. 15, 1963, printed in Russian. Poliarnii Nauchno-Issledovatel'skii i Proiktnyi Institut Morskogo Rybnogo Khoziaistva i Okeanografii im. N. M. Knipovicha, Moscow, U.S.S.R.:

"Ossene-zimne raspredelenie prednerestovykh i nerestovykh skoplenii saiki (Boreogadus saida Lepechin) v Barentsvom more" (Fall-winter distribution of prespawning and spawning aggregations of arctic cod in the Barents Sea), by V. P. Ponomarenko, pp. 177-197.

"Treska Murmanskogo poberezh'ya" (Cod of the Murman coast), by T. I. Glebov, pp. 69-130.

CRUSTACEA:
Pacific Crustacea, by Spencer Wilkie Tinker, 134 pp., illus., printed. Charles E. Tuttle Co., Rutland, Vermont. An illustrated popular-type handbook on the reef-dwelling crustacea of Hawaii and the South Seas.

DANISH SEINE:
"Frequency of hauls by Danish seiners in Bristol Bay with respect to catch in tons," by Hiroshi Maeda and Shiro Minami, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, July 1964, pp. 554-559, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

DOGFISH:
"Composition of the diacyl glyceryl ethers and triglycerides of the flesh and liver of dogfish (Squalus acanthias)," by Donald C. Malins, John C. Wekell, and Clifford R. Houle, article, Journal of Lipid Research, vol. 6, Jan. 1965, pp. 100-105, printed. University Publishers, Inc., 59 E. 54th St., New York, N. Y. 10022.

ECHO-SOUNDER:
"O registratsii ekholotom razrezhennoi ryby u dna" (Detection of dispersed fish near the sea-bottom by means of echo-sounders), by K. I. Yudanov, article, Trudy Nauchn.-Issled. Inst. Rybn. Khoz. Latviisk. SSR, vol. 3, 1961, pp. 175-183, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010.

"On the use of the echo sounder in lake investigations," by Roland Schroeder and Hanne Schroeder, article, Memorie, Instituto Italiano di Idrobiologia Dott Marco Marchi, vol. 17, 1964, pp. 167-188, illus., printed. Instituto Italiano de Idrobiologia, Milan, Italy.

ELECTRICAL FISHING:
"Electrical shrimp trawl is nearing commercial stage," by Aline Miller, article, National/Maine Coast Fisherman, vol. 46, no. 5, Aug. 1965, pp. 10-11, illus., printed, single copy 25 cents. Journal Publishing Co., 66 High St., Belfast, Me.

FISH BEHAVIOR:
"Izuchenie reaktsii ryb na setnoe polotno" (A study of the reaction of fish to net webbing), by N. E. Aslanova, article, Trudy Vses. Nauchn.-Issled. Inst. Morsk. Rybn. Khoz. i Okeanog., vol. 44, 1961, pp. 165-176, printed in Russian. Trudy Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Verkhn. Krasnosel'skaia No. 17, Moscow B-140, U.S.S.R.

"Some experiments in marine biotelemetry," by H. A. Baldwin, article, Naval Research Reviews, vol. 18, no. 2, Feb. 1965, pp. 15-20, illus., printed, single copy $0.15. Office of Naval Research, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The dolphin, an air-breathing marine mammal, is an excellent subject for specialized investigations of physiological responses which occur in mammals, including man, in the marine environment. However, the techniques and equipment necessary for measuring these responses, particularly at considerable ocean depths and pressures, are not now available. Thus the author is trying to devise telemetering devices which convey physiological information from the subjects to observers at the surface. Some of his studies are described in this article.

FISH CULTURE:
"Teoreticheskie i prakticheskie osnovy primeneniya iskusstvennogo ryborazvedeniya" (Theoretical and practical bases for artificial fish culture), by N. I. Kozhin, article, Voprosy Ikhtiologii, vol. 4, no. 1, 1964, pp. 92-96, printed in Russian. Akademiia Nauk SSSR, Ikhtiologicheskaia Komissaia, Moscow, U.S.S.R.

Articles from Izvestia Gos. Nauch-Issled. Inst. Ozern. Rechn. Rybn. Khoz., vol. 55, 1963, printed in Russian with English summary. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010:

"Khimicheskii metod rybokhozyaistvennogo preobrazovaniya ozer--predvaritel'nye rezul'taty i perspektivy" (A chemical method for rendering lakes suitable for fish culture--preliminary results and perspectives), by E. V. Burmakin, pp. 7-17.

"Perspektivy rybokhoziaistvennogo ispol'zovaniya malykh ozer, podgotovlennykh khimicheskim metodom" (Prospects in utilization of small chemically-treated lakes for fisheries or fish culture), by B. I. Ponedelko, pp. 127-134.

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Articles from Trudy Vses. Nauch.-Issled. Inst. Prudovogo Rybn. Khoz., vol. 12, 1963, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010:

"Vyrashchivanie ryboposadochnogo materiala na vyrabotannykh frezernykh polyakh s primeneniem agromeliorativnykh i intensifikatsionnykh meropriyatii" (The culture of fish for stocking in fertilized and harrowed ponds), by E. N. Khairulina, pp. 25-34.

"Vyrashchivanie tovarnoi ryby na kar'erakh gidrotorfa i vyrabotannykh frezernykh polyakh s primeneniem kompleksa intensifikatsionnykh meropriyatii" (Raising fish of commercial size in harrowed and fertilized ponds), by A. G. Mints, pp. 35-46.

FISHERY RESOURCES:

"The potential harvest of the sea," by Milner B. Schaefer, article, Transactions of the American Fisheries Society, vol. 94, no. 2, 1965, pp. 123-128, illus., printed. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

FISH FILLETS:

"Skinning fish fillets," article, Food Manufacture, vol. 39, May 1964, p. 81, printed. Grampian Press, Ltd., The Tower, Shepherds Bush Rd., Hammersmith, London W6, England.

FISH FLAKES:

"A nutritional evaluation of fish-potato flakes," by M. A. Krishnaswamy and others, article, Food Technology, vol. 19, 1965, p. 629, printed, single copy $1.50. The Garrard Press, 510 N. Hickory St., Champaign, Ill. 61823.

FISH HATCHERIES:

Investigation and Development of Fish Hatcheries, by Robert A. Weir, Fish and Wildlife Series no. 11, 28 pp., processed, 1964. Department of Lands and Forests, Toronto, Ontario, Canada.

FISH-LIVER OIL:

"Changes in the fatty acid composition of cod-liver oil caused by radiation," by A. A. Fomin, article, Chemical Abstracts, vol. 61, July 6, 1964, p. 845g, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"CIS-11-docosenoic acid in cod liver oil," by Mary J. Chisholm and C. Y. Hopkins, article, Canadian Journal of Biochemistry, vol. 43, Jan. 1965, pp. 130-132, printed. National Research Council, Ottawa, Canada.

FISH MEAL:

Favourable Effect of Antioxidants on Metabolizable Energy and Protein Value of British Columbia Herring Meal, by B. E. March and others, Circular No. 34, 5 pp., printed, 1965. Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

"Feeding experiments with meal produced from herring preserved with sodium nitrite and formalin--possible connection between nitrite preservation and toxic hepatosis in sheep," by N. Koppang and others, article, Nord. Vet.-Med., vol. 16, 1964, pp. 343-362, printed in Norwegian. Veterinary College of Norway, Oslo, Norway.

"Fish meal as insurance for poultry and swine," by C. F. Winchester, article, Feed Age, vol. 15, no. 1, p. 35, printed. American Trade Publishing Co., 71 Vanderbilt Ave., New York, N. Y. 10017.

"The influence on chick growth of fishmeals differing in form of raw material, species of fish, and processing," by H. Vogt, article, Archiv für Geflügelkunde, vol. 29, no. 1, 1965, p. 72, printed in German. Fritz Pfenningstorff, Herworthstr. 3, Berlin-Lichlerfelde-1, German Federal Republic.

"Isolation and identification of a hepatotoxic factor in herring meal produced from sodium nitrite preserved herring," article, Die Naturwissenschaften, vol. 24, 1964, p. 637, printed in German. Springer-Verlag, Reichlietschufer 20, Berlin W35, Federal Republic of Germany.

"Quality of fish meal as a food," by K. Miwa, article, Hokusuishi Geppo (Journal of the Hokkaido Fisheries Research Scientific Institution), vol. 21, 1964, p. 226, printed in Japanese. Hokkaido-Ritsu Suisan Shikenjo, Hamanuka-Machi, Yoichi-Machi, Hokkaido, Japan.

"Studies on the incidence of Salmonellae in imported fishmeal," by J. Jacobs and others, article, Tijdschrift voor Diergeneeskunde, vol. 88, no. 22, 1963, 6 pp., printed in Dutch. Dr. W. A. DeHaan, Rubenslaan 123, Utrecht, Netherlands.

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History Under the Sea (A Handbook for Underwater Exploration), by Mendel Peterson, Smithsonian Publication 4538, 233 pp., illus., printed, 1965, $3.00. Smithsonian Institution, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A work unique in its field, this volume provides a reference to which a serious underwater historian or archaeologist may turn for instruction on exploration, recovery, and preservation techniques, and for the identification of artifacts. Included are chapters on locations of underwater sites, some expeditions in the Western Hemisphere, search techniques, condition of underwater sites, surveying those sites, and recovery techniques. Preservation of materials (metallic, ceramic, glass, animal, and vegetable) recovered from water, and identification of shipwrecks are discussed in considerable detail in the final chapters. The book also contains a bibliography and lists of marine museums and archives. Photos and drawings supplement the text, adding interest and excitement for historians and laymen alike. For people in fisheries occupations the book will be a spellbinder, for it opens up new vistas in the oceans' depths.

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Facts and Possible Opportunities in the West Pakistan Shrimp Industry, K-223-S, 26 pp., processed, June 1965. Investment Advisory Centre of Pakistan, Karachi, Pakistan. Discusses operations, customs, and practices of shrimp trawlers in the Karachi area. Shrimp exports and the rise in fishery products' export values, 1957-64, are shown in statistical tables. The current and planned number of shrimp trawlers, the construction cost of a single trawler, its profitability, and the capital required for owning a trawler are covered. The report concludes by outlining several possible investment opportunities in the West Pakistan shrimp fishery and related industries.

POND FISHERIES:

Employment of Polychloropine for Altering Content of Fishes in Small Lakes of Belorussian SSR, USSR, by P. S. Nevyadomskaya, 6 pp., processed, May 17, 1965, $1. (Translated from the Russian, Vestsi Akademii Navuk Beloruskay SSR, Seryya Biyalagichnykh Navuk, no. 1, 1965.) Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

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"Relatorio do Gremio dos Industriais de Conservas de Peixe do Norte" (Report of the Society of Northern Fish Canners, 1964), article, Conservas de Peixe, vol. 20, no. 231, June 1965, pp. 17-19, 21, 23-24, 34, printed in Portuguese. Sociedade da Revista Conservas de Peixe, Lda., Regueirão dos Anjos, 68, Lisbon, Portugal.

PRESERVATION:

Fish Handling and Preservation (Proceedings at Meeting on Fish Technology, Scheveningen, September 1964), 332 pp., illus., processed, 1965, US$5, or 30s., F 20, Sw. fr. 20, DM 16.50. Organisation for Economic Co-operation and Development, Paris, France. (For sale by McGraw-Hill Book Company, O.E.C.D.-Unit, TMIS Annex, 351 W. 41st St., New York, N. Y. 10036.) "The development of fishery technology not only enables the industry to face competition from other foodstuffs, which as a result of changed produc-

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tion and processing methods are enjoying a greater consumption, but also to take up a more important place in the household diet," states the introduction. The book itself contains lectures presented at the Scheveningen meeting, grouped by subjects: fish preservation at sea (with emphasis on quick-freezing); refrigerated sea water; fish handling (at sea and on shore); cold storage and thawing (with emphasis on thawing problems which are important to the quality of the end-product); port markets--quality and containers; packaging for retail; and distribution. Concluding remarks point out that ". . . in the national or international contact which has been established in the technological field between industry and research-workers, the problem of remunerative application deserves the greatest possible attention." An appendix lists the participants at the meeting. This is a comprehensive record of the meeting.

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Effects of Ionizing Radiation on Lipids of Fish, Final Report, Nov. 1963-Nov. 1964, by Maurice E. Stansby and George Kudo, TID-21405, 27 pp., printed, 1964, $2. Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Port Royal and Braddock Rds., Springfield, Va. 22151.

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Cape Hatteras, N. C., to Brunswick, Ga., 1965.

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622 pp., illus., printed, 1965, $6. Columbia University Press, International Documents Service, 2960 Broadway, New York, N. Y. 10027. The sixth edition of this reference book for people who produce, market, and buy fish has recently been issued, with the importer and exporter sections expanded. Included are sections on foreign representatives, shipbuilders, suppliers of vessels, and processors in Belgium, Denmark, the Faroe Islands, Finland, France, Germany, Iceland, Ireland (a new addition), the Netherlands, Norway, Sweden, and the United Kingdom. There is also a section containing lists of importers and exporters of fishery products in other European countries, Africa, Asia, Australia, New Zealand, the United States, Canada, and Central and South America. A separate part of the yearbook contains a register of fishing vessels in the selected European countries. Features of this edition are statistics on world landings of fish and shellfish, a list of fish terms in different languages, and an article detailing features of the United States-built stern trawler Narragansett.

STUDY LAUNCHED OF ECONOMIC POTENTIALITIES OF CONTINENTAL SHELF

A study of the economic potentialities of the Continental Shelf, a vast 850,000 square miles of largely unexplored and unexploited territory belonging to the United States, has been launched by the U. S. Department of Commerce. The Department's Coast and Geodetic Survey announced June 13, 1965, that it awarded a contract to the Battelle Memorial Institute, Columbus, Ohio, to make "an economic study of the relationship of the scientific survey activities of this agency with respect to the Continental Shelf and their impact on the economic development of the United States." Estimated cost of the 14-week study is $55,000.

The Coast and Geodetic Survey, as the Nation's chief civilian oceanographic agency, has been conducting, as part of its extensive work in oceanography, limited surveys of the Continental Shelf. The study will include an analysis of this work, of the capabilities of the Agency for enlarging its activities in this area, and of the potential benefits to the American economy if this is done.

Under an international agreement signed last year, the submerged extension of the continent off the Atlantic, Pacific, and Gulf coasts of the United States has been acquired by this country for economic exploitation, the most extensive territory to be added to the country since the Louisiana Purchase in 1803. The agreement provides that United States sovereignty covers "the seabed and subsoil of the submarine areas adjacent to the coast out to a depth of 200 meters," or 656 feet. The agreement further provides that sovereignty will also extend beyond that point to the extent that its natural resources can be exploited by this country.

The Continental Shelf extends from 10 to 300 miles off the American coast, including 175 miles off Cape Cod, from 50 to 125 miles off the South Atlantic states, from 50 to 150 miles into the Gulf of Mexico, from 10 to 50 miles off the Pacific Coast, and approximately 300 miles off the Alaskan coast. The Hawaiian Island's Shelf extends 10 to 50 miles offshore.

While the economic potentialities of the submerged offshore areas of the earth's continents are largely unknown, the exploitation of underwater resources is already under way in various parts of the world. Efforts to extract wealth from beneath the sea include extensive recovery of oil off the shores of the United States; diamond mining off the coast of southwest Africa; iron and coal mining off the Continental Shelf of Japan; tin off the Malaysian Shelf; and the extraction of magnesium and bromine from the sea at Freeport, Tex. Scientists say drilling in depths greater than 200 meters is already feasible.

ANTIMICROBIAL SUBSTANCES IN CLAMS POSSESS TUMOR-PREVENTIVE ACTIVITY

Paolins, the antimicrobial substances known to be present in sea mollusks, have been found by latest experimental evidence to possess a tumor-preventive activity in addition to their antibacterial and antiviral effects, according to a report by scientists at the National Institutes of Health (NIH), Public Health Service, U. S. Department of Health, Education, and Welfare.

The discovery that extracts from the common clam prevent or delay virus-induced tumors in hamsters and also inhibit herpes simplex virus in tissue cultures, was reported December 11, 1965, by Dr. C. P. Li of the Division of Biologics Standards, NIH, at a meeting of the New York Academy of Sciences in New York City. This investigation was made by Dr. Li, Dr. Benjamin Prescott, Dr. Bernice Eddy, Dr. William Green, and G. Caldes, E. C. Martino, and A. M. Young.

They prepared the extract from fresh clams purchased in August and September 1964, since clams processed during the summer months have been reported to possess more inhibitory activity. The clams were shucked, homogenized, and mixed with an equal amount of ammonium sulphate solution. The supernatant was then dialized and dried, and the resulting tan-color, water-soluble powder was fractionated by column chromatography. Only the major fractions 1, 2, and 3 were used in the study.

Fractions 1 and 2 were administered to baby hamsters inoculated with adenovirus type 12. In one typical experiment, the hamsters were inoculated subcutaneously with the virus. Four days later, daily injections of the clam fractions were given to each infected hamster for two days. Infected, untreated hamsters served as controls. After 90 days, 8 of 11 controls developed tumors. Among two groups of infected hamsters that had been treated with the clam extracts, 3 of 10 and 5 of 10 developed tumors, with the average appearance of the tumors delayed for 13 days in comparison to the control animals.

Experiments for antiviral activity of the clam material against herpes simplex (cold sore) virus were made in primary rabbit kidney cells. The herpes simplex virus was inoculated into cultures immediately after the 3 clam extract fractions were added. After 3 days of incubation, the cytopathic effect in the treated tubes was found to be considerably suppressed with the virus titer reduced by 90 percent as compared to the control tubes.

In discussing the study, Dr. Li pointed out that the antiviral substances isolated from shellfish material probably belong to or are derived from the glyco- or mucoproteins. In this study, all three fractions gave positive protein and carbohydrate reactions. Paolins are apparently widely distributed in nature; they have been found in plants and in certain animal tissues, as well as in sea mollusks.

"It is possible that the intake by man or animals of certain foodstuffs rich in paolins plays an important role in the natural defense against certain viral infections," Dr. Li speculated.

BACKGROUND

Meat of the abalone has been a common food item in China for many generations. A familiarity with this sea animal, which has access to a wide variety of organic material of biological origin, led Dr. Li to consider it as a potentially valuable source of material in which to search for an antimicrobial agent. His work with the abalone, first reported in 1960, showed that commercial canned abalone juice given orally to mice possessed an inhibitory effect against intraspinal infection of types 1 and 3 poliovirus. He also found that crude fresh abalone juice possessed marked inhibitory effect against Staphylococcus aureus. Subsequent work at NIH has been done with Dr. Benjamin Prescott, of the National Institute of Allergy and Infectious Diseases.

(Continued on next page.)

Dr. Li then screened a number of sea animals for antimicrobial activity against S. aureus, and found that extract of oysters and clams also possessed marked antimicrobial effects.

The next step was the isolation of several fractions from abalone juice by ion exchange chromatography and the discovery that one active fraction was bactericidal, and another fraction was found to be rich in antiviral substance. Dr. Li named the antibacterial substance Paolin 1 and the antiviral substance Paolin 2, from the Chinese word paolin, meaning abalone.

Dr. Li and his associates then switched their attention to the oyster and obtained a substance that possessed both antibacterial and antiviral properties. They found it protected against Streptococcus pyogenes infection in mice. The protective effect was much the same against type 1 poliovirus, reducing the paralytic rate from 70 to 40 percent. When mice were fed this substance 24 hours after infection with influenza B virus the death rate from influenza was reduced from 70 to 50 percent.

Although the work of Dr. Li and his associates has been primarily concerned with antiviral substances in sea foods, they have also successfully demonstrated these substances in plant and animal tissue (snow peas and calf thymus). The antiviral agents in these hosts were separated by extraction with either acetic acid or water, and by chromatography.

These antiviral substances are probably representative of a large group of substances occurring in nature in similar or related forms. Thus far, their existence can be detected only by antiviral assay in vitro and in other living organisms.

The mode of action of these substances is unknown. They do not seem to inactivate viruses, nor to prevent the virus from being adsorbed to or penetrating into susceptible cells. They appear to interfere with the replicating process of the virus within the cell.

GULF STREAM TO BE SURVEYED BY OCEANOGRAPHIC SCIENTISTS

The Gulf Stream, which flows like a river 40 miles wide and 2,000 feet deep through the Atlantic Ocean, was closely surveyed by scientists during summer 1965.

By understanding more of the forces and patterns of that vast ocean river, scientists will be able to come closer to predicting adjacent changes in the weather and fishing conditions, said the chief oceanographer of the Coast and Geodetic Survey, U. S. Department of Commerce.

The oceanographic program was slated to get under way in July. Scientists participating in the program were to be from the Coast and Geodetic Survey; U. S. Weather Bureau; the Massachusetts Institute of Technology, Cambridge; Woods Hole Oceanographic Institution, Woods Hole, Mass.; University of Rhode Island, Kingston; Lamont Geological Observatory of Columbia University; and the University of Miami. (Science News Letter, April 24, 1965.)