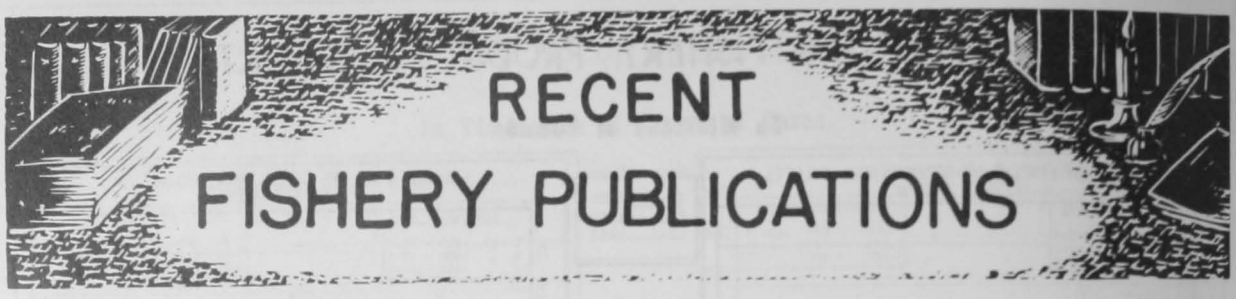

Recent publications of interest to the commercial fishing industry are listed below.

FISH AND WILDLIFE SERVICE PUBLICATIONS

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

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

Number Title

CFS-882 - Canned Fish & Byproducts, 1952 Annual Summary, 20 p.
CFS-883 - Frozen Fish Report, June 1953, 8 p.
CFS-886 - Fish Meal and Oil, May 1953, 3 p.
CFS-891 - Massachusetts Landings, April 1953, 7 p.
CFS-892 - Alaska Fisheries, 1952 Annual Summary, 7 p.
CFS-893 - New England Fisheries, 1951 Annual Summary, 7 p.
CFS-895 - Frozen Fish Report, July 1953, 8 p.
CFS-897 - Maine Landings, May 1953, 4 p.
CFS-899 - Florida Landings, May 1953, 6 p.
CFS-900 - Texas Landings, June 1953, 3 p.
CFS-902 - New Jersey Landings, May 1953, 2 p.
FL -336q- Quarterly Outlook for Marketing Fishery Products, July-September 1953, 38 p.
SL -107 - Firms Canning Fish and Shellfish Specialties, 1952 (revised), 6 p.
Sep. No. 353 - Gulf of Maine Bluefin Tuna Exploration--1952.
Sep. No. 354 - Technical Note No. 27--Alaska Pollock: Proximate Composition; Amino Acid, Thiamine and Riboflavin Content; Use as Mink Feed.

SSR-Fish. No. 83 - Five Japanese Papers on Skipjack (Translated from Japanese), 82 p., August 1952. Includes the following papers: "Skipjack Fishing Grounds and Oceanographic Conditions in the Northeastern Sea Area," by Takeo Sasaki; "On the Stock of Skipjack," by Morisaburo Tauchi; "Notes on the Shoal of Bonito (Skipjack, Katsuwonus pelamis) along the Pacific Coast of Japan," by Hiroaki Aikawa; "Local Variations in the Composition of Skipjack (Katsuwonus pelamis) Schools," by Michitaka Uda and Jiro Tsukushi; and "Types of Skipjack Schools and Their Fishing Qualities," by Michitaka Uda.

SSR-Fish. No. 101 - Fluctuation in Trap-Net Catches in the Upper Mississippi River, by D. W. Kelley, 41 p., illus., processed, May 1953. This paper evaluates some of the factors found to influence the catch of trap nets in the Mississippi River during the summer of 1948. In order to study seasonal trends in trap-net catches, five permanent netting stations were selected in backwaters of the Upper Mississippi River a few miles below La Crosse, Wisconsin. One trap net was fished at each of these stations for nine 10-day netting periods that were evenly spaced between May 15 and September 25, 1948. Eleven species were caught in quantities large enough to note catch trends during the season. Fluctuations in mean catch during this 4½-month period were considerable. They were greatest for the black crappie and the bluegill, and least for the carp and the white crappie. Three species--black crappie, white crappie, and bluegill--were caught in quantities large enough to allow study of causes of catch fluctuations. These causes may be divided into two groups: (1) those that resulted in changes in abundance of fish; and (2) those that resulted in changes in the rate of activity of the fish. Evidence was gathered that both abundance and activity rate of bluegills and black crappies change considerably during the season.

SSR-Fish. No. 103 - Length Measurements of Lake Yellowstone Trout, by Oliver B. Cope, 20 p., illus., processed, June 1953.

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

Stabilization of the Phosphate Ratio of Sea Water by Freezing, by Albert W. Collier and Kenneth T. Marvin, Fishery Bulletin 79 (From Fishery Bulletin of the Fish and Wildlife Service, Volume 54), 9 p., printed, 10 cents, 1953. This paper reports the first of a series of experiments to test the stability of certain organic and inorganic complexes in sea water after the samples have been quick-frozen. In oceanographic investigation, it is often desirable to stabilize organic and certain inorganic components of sea water for delayed analysis. This stabilization, which cannot be achieved with chemical additives, is necessary because of biotic activity. Instability in the concentration of inorganic phosphorus is demonstrated in samples of sea water held at room temperature, while stability is demonstrated in samples quick-frozen and held at subzero temperatures. Gains in productive manpower, in precision, and in the variety of analyses possible can all result from the adoption of this technique. The authors state that "because the greater precision inherent in this procedure permitted more accurate analyses, it has already become evident that spatial variability of inorganic phosphorus in sea water is greater than has been recognized and should be investigated further."

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE AGENCIES OR PUBLISHERS MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

"Acid Preservation of Fish and Fish Offal," by Halvor Petersen, article, FAO Fisheries Bulletin, vol. 6, no. 1-2 (Jan.-Feb./March-April 1953), pp. 18-26. The report describes inexpensive methods of manufacture of fish silage involving very little special equipment. The product is suitable for the feeding of poultry, swine, and cattle.

Fish for silage must be absolutely fresh. The fish must be minced thoroughly before being mixed with the chemicals to obtain effective preservation and to avoid the need for large quantities of chemicals. Ordinary meat grinders may be used; however, large plants find it convenient to use specially built machines.

The minced fish is further treated for silage by one of five methods: (1) Sulfuric-acid silage (semi-finished product)--sulfuric acid is added to the minced fish to a pH value of about 2. The material is stored in concrete tanks coated on the inner surface with bitumen. Sulfuric-acid silage must be partially neutralized by the farmer just before use. Chalk is used for the purpose. The partially neutralized product will keep not longer than 48 hours. (2) Formic-acid silage (finished product)—formic acid is added to the minced fish according to the following formulae:

0.25×0.3 (% ash) = liters of formic acid (90 percent) per 100 kg. of raw material in winter.

0.50×0.3 (% ash) = liters of formic acid (90 percent) per 100 kg. of raw material in summer.

Formic-acid silage is non-perishable and can be used without neutralization. (3) Sulfuric acid-formic acid silage (finished product)—this product is produced by two methods: (a) sulfuric-acid silage (pH 2) is partly neutralized to pH 4 and formic acid (85 percent) added to 1 percent. The mixture is thus reduced to pH 3.5 and may be used as feed without further neutralization. (b) The raw material is mixed with sulfuric acid (50 percent) plus formic acid (85 percent). In summer, the author indicated that 2 liters of sulfuric acid (50 percent) plus 0.8 liter formic acid (50 percent) can be used per 100 kg. of codling. These products need not be neutralized before use. The second method (b) is cheaper to produce than the formic-acid silage since the quantity of expensive formic acid used is less. (4) Sulfuric acid-molasses silage (finished product)—the product is prepared by adding 2 liters of sulfuric acid (50 percent) plus 50 kg. of molasses to 100 kg. of minced fish. The finished product has a pH of about 4.5 and may be used without neutralization. In hot weather the mixture ferments quickly. Fermentation may be inhibited to some extent by adding sodium benzoate to the silage in a quantity corresponding to 0.2 percent benzoic acid. (5) Fermentation silage (finished product)—this method is covered by Danish Patent Application No. 3415-50 (1952). It involves the use of 15 kg. of molasses and a culture of lactic acid bacterium S. plantarum per 80 kg. of minced fish. The product reaches a pH of 3 to 4 in 3 to 4 days. It has a good keeping quality, no unpleasant fish odor, and need not be neutralized before use.

One kg. of fish silage contains about the same quantity of protein as about 4 kg. of skimmed milk. Fish silage may be used as follows: Poultry: laying hens, 20 gm. fish silage per bird daily; breeding birds, up to 30 gm. per bird. Birds for the table should not be fed fish silage during the last 3 weeks before slaughtering; week-old chicks, 50 gm. per 100 chicks daily, gradually increased to 500 gm. at the age of 5 weeks, and 850 gm. at the age of 10 weeks; ducks, 10 percent of the whole diet. Pigs: pregnant sows, $\frac{1}{2}$ to $\frac{3}{4}$ kg. fish silage per sow daily; suckling sows, $\frac{1}{2}$ kg.; weaned pigs (age 7-8 weeks), 50 gm. per pig, daily; gradually increased to 150 gm. at the age

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of 10 to 12 weeks. If pigs are to be used for bacon, use of fish silage should cease when the animals reach a weight of about 30 kg. Cattle: milk cows, 1 kg. fish silage per cow daily; young cattle, ½ kg.

The fish silage must be stored in a place where the temperature does not exceed 15° C. (59° F.). The silage must have fresh acid odor.

Production of fish silage has been economical in Denmark because: (1) distances from fishing harbors to the farms are small; (2) the temperature, especially in winter when the greatest consumption takes place, is low enough so that artificial refrigeration is not necessary, and (3) plants are established in places where the supply of raw material is so small that it does not pay to produce fish meal.

A selected bibliography of 6 references is given.

—F. T. Piskur

"Age and Length Composition of the Sardine Catch off the Pacific Coast of the United States and Mexico in 1952-53," by Frances E. Felin, John MacGregor, Anita E. Daugherty, and Daniel J. Miller, article, California Fish and Game, July 1953, vol. 39, no. 3, pp. 409-417, printed. Department of Fish and Game, San Francisco, Calif. This is the seventh report on the age and length composition of the catch of sardine (Sardinops caerulea) off the Pacific Coast of North America. During the 1952/53 season the fishery was carried on off California during the regular fishing season only, but off Baja California throughout the year. Included are tables showing, by sex and region of catch, the length-frequency distributions of fish of each year class from the random scale samples taken in the 1952/53 season; the mean length and standard error of the mean for each year class sampled in the 1952/53 season, by sex and region of catch; the calendar dates for the lunar months in the 1952/53 season; and the numbers of fish, by region of catch and in each year class, caught during the season.

The Biscayne Bay Commercial Fishery, by J. B. Siebenaler, Technical Series No. 6, 20 p., illus., printed. State Board of Conservation, Tallahassee, Fla., 1953. This is a report on an investigation carried out by the Marine Laboratory of the University of Miami, under the direction of the Florida State Board of Conservation, designed to provide a basis for scientific management and control of Biscayne Bay's commercial fishery. The author discusses the objectives and methods of conducting the survey, number of fishermen and boats, commercial production of Biscayne Bay, species taken, value of the commercial catch, fishing methods, fishing areas, and regulation of the fishery. In his recommendations, the author states that closure of the Bay's gill-net fishery does not appear justified, in view of the economic value of the fishery, the fact that mullet (a non-game fish) makes up almost all the catch, and since the gear used is not harmful to the bottom. A major source of sport-fishing bait would disappear if bay fishing were banned and a valuable resource, the mullet, would be unexploited, continues the author. Since over two-thirds of the catch in Biscayne Bay is of silver mullet, which can only be caught efficiently by 2½-inch stretched-mesh, the author recommends that the laws be changed to legalize the use of a gill net of this size in the Biscayne Bay mullet fishery.

(California) Common Ocean Fishes of the California Coast, by Phil M. Roedel, Fish Bulletin No. 91, 188 p., illus., printed. Marine Fisheries Branch, Department of Fish and Game, San Francisco, Calif., 1953. This bulletin is designed as a guide to the marine fish of California which are likely to be caught by commercial and sport fishermen. Because the bulletin is meant for anyone interested in fish, regardless of his technical background, scientific terminology has been avoided as far as possible. Those technical terms which do appear are defined in the glossary. Descriptions of appearance and color refer to adult specimens, and the color patterns given are believed typical of freshly-caught fish. Notes on fishing season and fishing gear are based on California records for the years 1947-1952. The relative importance of the different species as game and commercial varieties changes somewhat from year to year; rankings are exclusive of shellfish and mollusks and are based on California records for 1951. This bulletin includes sections on the common and scientific names of fish, and descriptions and illustrations. It also includes a glossary of technical terms, a key to some adult marine fish of California, an index to the common names, and an index to the scientific names of the fish.

"Caribbean Markets for Canadian Fish," by E. M. Gosse, article, Foreign Trade, vol. 14, no. 340 (July 4, 1953), pp. 6-9, printed, single copy 10 cents. The Department of Trade and Commerce, Ottawa, Canada. (Available from The Queen's Printer, Government Printing Bureau, Ottawa, Canada.) A review of the demand for Canadian fish in four Caribbean countries (Jamaica, Haiti, Dominican Republic, and Puerto Rico) with advice on what consumers prefer, methods of shipping, and the sales outlook.

Climate, Vegetation & Man, Leonard Hadlow, 288 p., illus., printed, $4.75. Philosophical Library, New York, N. Y., 1952. This book surveys life in its climatic setting. The author in his preface states that the influence of climate upon life on earth—plant, animal, and human—is of the highest importance and can hardly be overemphasized. The principles that govern day and night, the seasons, and the world distribution of temperature, atmospheric pressure, winds, rainfall, and ocean currents are dealt with in Part I. Natural vegetation is studied in relation to its climatic needs in Part II. The major climatic regions of the world are described in Part III, with special emphasis placed upon the way climate governs the activities of man. The difference between maritime (or oceanic) air and continental air is explained. The maritime climates of regions with on-shore winds, temperature, and ocean currents are discussed. In a section titled "The Harvest of the Sea," the au-

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thor reviews the relationship of fishing to climate and weather, and says: "In spite of these scientific aids, the fisherman's life is still dangerous." There are a number of other references to fishing throughout the book. Some of the major subjects covered of interest to fishermen and other individuals interested in fishing are: climate and weather; temperature and its chief and minor controls; how temperature is mapped; pressure belts; the winds of the world; why it rains; a world pattern of cloud and rain; and the movements of the waters.

Co-operative Finance in Japan and the Central Co-operative Bank for Agriculture and Forestry, Reference No. 12, 23 p., printed. The Central Co-operative Bank for Agriculture and Forestry, Tokyo Building, Marunouchi, Chiyoda-ku, Tokyo, Japan, May 1953. Describes finances of fishery cooperatives, in addition to agricultural and forestry cooperatives. It discusses the cooperative financial organization in Japan and the financial situation of cooperative finance and its position in the general financial field. Also describes the organization and function of the Central Co-operative Bank.

I. The Distribution of the Green Crab, CARCINIDES MAENAS (L.) in the Northwestern Atlantic, by Leslie W. Scattergood, Fisheries Circular No. 8, 10 p., illus., printed; and II. Observations on Green Crabs (C. MAENAS) in Maine, by Robert L. Dow and Dana E. Wallace, pp. 11-15, printed. Department of Sea and Shore Fisheries, Vickery-Hill Bldg., Augusta, Maine, October 1952. The first part of this bulletin is concerned primarily with the extension of the green crab's range along the Maine coast. The author traces the remarkable spread of the Carcinides with literature citations and his own personal observations. The second part of this bulletin discusses the green crab which has become increasingly important in Maine waters as a soft-shell clam predator. The authors describe briefly the life history of the green crab and how they destroy clam colonies.

"An Evaluation of the Marine Sportfishing Record System in California," by John L. Baxter and Parke H. Young, article, California Fish and Game, July 1953, vol. 39, no. 3, pp. 343-353, illus., printed. Department of Fish and Game, San Francisco, Calif. The sportfishing record system in California is based on the reported daily catch of boats operating for hire in marine waters. Since 1936 the owners or operators of party fishing vessels that carry paying passengers have been required by law to keep an accurate record of the catches made from their boats. To evaluate the quality and the quantity of the sport-catch records, a physical check of the boat catches was started in 1947. This consisted of an actual count of the fish landed on a party fishing boat. The percentage accuracy of a particular boat was determined by comparing the actual count with the written record prepared by the boat operator. The actual counts and the boat reports are summarized in this report to show total numbers by species. Boat report figures are expressed as a percentage of the actual count. Statistical data are also given on the number of party boats checked by port for 1947-51; average weight per fish for some of the more important sport species; and number of fish counted per angler day, by port of landing. A list of the common and the scientific names of the fish is included. It was found that boat record totals can be expected to closely approximate the actual records of the total numbers of fish landed. There has been some increase in the accuracy of individual species reports; however, further improvement is necessary. The article points out that the sport-catch reports of the important game fishes are accurate enough to fulfill the purposes for which they are intended.

The Fisheries of New England (Report of the Committee of New England of the National Planning Association), Number 2, 52 p., illus., printed, 60 cents. New England Council, Statler Bldg., Boston, Mass., 1953. This pamphlet presents one of the 20 topical reports of the Committee of New England. It is a complete document in itself, yet it forms an integral part of the final report, The Economic State of New England, which is to be published soon in book form. This report describes the use that New Englanders make of the fisheries, the possibilities for further development, and the problems faced by the industry. It contains suggestions for ways in which the industry can be strengthened to its own benefit and that of New England. It discusses the history and organization of the New England fishing industry; increasing the demand for New England fish products; increasing the supply of fish; the shellfish industries of New England; and intra-industry relations.

"Fisheries of the Northwest Territories," article, Trade News, May 1953, vol. 5, no. 11, pp. 7-8, illus., processed. Department of Fisheries, Ottawa, Canada. A review of the production and marketing of fish from Great Slave Lake and vicinity during the 1952 summer season and the 1952/53 winter season. Also describes the development of the new fishery for belugas or white whales in the waters of Hudson Bay and the Churchill River.

Fishing in Michigan, 34 p., illus., printed. Michigan Department of Conservation, Lansing, Michigan. A pocket-sized summary of Michigan's game fish, fish cookery, boats, camping, and stream, lake, "deep sea," and ice fishing in Michigan waters. Detailed drawings of each species of fish will give anglers a ready identification key. A fishing map indicates the location of fish by regions as found within the State, and types of baits generally used in taking the fish are listed in the text. Although intended primarily for the sports fisherman, the publication contains information of interest to the commercial fisherman.

Fiskeri-Undervisningen (Instructions for Fishing), 1951-1952, Arsberetning vedkommende Norges Fiskerier 1952-Nr. 4, 42 p., illus., printed in Norwegian. Fiskeridirektøren (Directorate of Fisheries), Bergen, Norway, 1953. Contains the names and locations of vocational schools in Norway for individuals interested in the fishing trade. There are listed also the various courses offered in the schools for fishermen and the types of examinations given for those engaged in or interested in the trade, and the locations of training stations. The Appendix is con-

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cerned with the number of applicants attending the various courses in the Norwegian Government's vocational fishermen schools at Aukra, Bodø, and Florø and those held on board the vessel Statsrad Lehmkuhl, the number of enrolled students in the schools for the years 1948/49-1951/52, and the enrollment from certain districts.

(Georgia) Compilation of Georgia Laws and Regulations Pertaining to Upland Game, Fresh Water Fishing and Commercial Salt Water Fishing, 108 p., printed. State Game and Fish Commission, 412 State Capitol, Atlanta, Georgia, July 1953. A compilation of the hunting and fishing laws and regulations of the State of Georgia was issued recently by the Georgia State Game and Fish Commission. The chapter on commercial licenses covers: fees and use of fish peddler's and fish seller's licenses; taking shad for purposes of sale without license; necessity of procuring licenses for commercial fishing boats; license fees levied on commercial boats; licenses for salt-water commercial fishing boats; license tags on commercial fishing boats operating in tidewater Georgia; licenses of persons engaged in commercial fishing in salt waters; false swearing to procure fishing license; duty to keep record books of tidewater Georgia fishing boats; non-residents prohibited from catching shrimp and prawn; and to whom fishing licenses are issued. Other chapters pertaining to commercial fisheries cover: general provisions for fishing; taking shrimp, prawn, and crabs; and leasing oyster beds.

(Gold Coast) Report on the Fisheries Department for the Year 1951-52, by F. R. Johnson, 9 p., illus., printed, 2s. (about 30 U. S. cents). Government Printing Department, Accra, Gold Coast, 1953. This report, which covers the Fisheries Department's financial year from April 1, 1951, to March 31, 1952, describes the following activities: (1) continued study of the herring catch and its seasonal fluctuations; (2) further experiments in the use of motor fishing vessels, both in the herring fishery and for trawling; (3) exploration of fishing grounds in the Sekondi-Takoradi area; (4) recording of seine catches in the Keta district; (5) recording of catches on the Volta River; (6) operation of fisheries instruction schemes on rivers in the Northern Territories; (7) utilizing water supply reservoirs for fish production; (8) development of fisheries in the smaller streams of the North; (9) canning fish; (10) experiments in the preparation of edible fish powder; and (11) preparation for the Department's boat-building project.

Havsfisket Under Senare Ar (Sea Fishing During Past Years), by Klas Wallberg, 23 p., illus., printed, in Swedish. Agricultural Marketing Board, Goteborg, Sweden. This report is divided into five sections: (1) introduction; (2) main features of the development of the fishing industry; (3) price regulations within the fishing industry; (4) foreign trade in fish; and (5) the domestic market and the consumption of fish. Also includes a number of interesting and descriptive diagrams and tables, and gives a very satisfactory review of the Swedish fishing industry during recent years.

Holland Fish Trade (Review of the Netherlands Fishing Industry), no. 1 (May 1953), 19 p., illus., printed, fl. 3.75 per year (about US$1.00). N. V. Drukkeru Trio, Nobelstraat 27, The Hague, Netherlands, May 1953. This is the first issue of a new periodical which is to be published bimonthly. It contains articles of an economic or technical nature together with statistical surveys of the Netherlands fishing industry and related industries. Five articles are included in this issue: (1) "Salted Herring—A Famous Netherlands Quality Product;" (2) Ijmuiden...The Principal Sea-Fish Port;" (3) "Favourable Development of the Netherlands Fish Canning Industry;" (4) "Greater Exports of Smoked Herring;" and (5) "Netherlands Fisheries Reach Record Production in 1952." A section on "Fishery Topics" is also included.

How to Prepare Maine Lobster, 3 p., printed. The Maine Department of Sea and Shore Fisheries, Augusta, Maine. Contains the following basic recipes: boiled, broiled, baked, and fried lobster; lobster stew, salad, roll, newburg, thermidor; and lobster cocktail sauce. All of the Maine lobster is edible except the bony shell structure, the small crop or craw in the head of the lobster, and the dark sand vein running down the back of the tail meat. The green is the liver (tomalley) and the white is the fat. The red or "coral" is actually the undeveloped roe or spawn of the lobster.

(Institute of Seaweed Research) Annual Report for 1952, 43 p., printed. Institute of Seaweed Research, Inveresk, Midlothian, Scotland. The report is a summary of the research studies carried out during 1952 by the Institute of Seaweed Research, Scotland. The results are available in greater detail in 24 papers published during the year or submitted for publication. A list of these publications, with abstracts, is included. Most emphasis has been placed on research work on: (1) resurveying of certain sublittoral brown seaweed beds to prove the efficacy of the survey methods and the seasonal variation in seaweed growth; (2) the determination of the nutritional value of seaweed; (3) the ensilaging of seaweed; (4) the semi-technical production, cost analysis, and market survey of mannitol; and (5) the fitting out of a 51-foot prototype harvesting vessel (M. V. Chondrus) with dual continuous grapnels. Considerable effort has been made to determine the value of certain algal chemicals as substrates for microbiological synthesis, and to isolate and identify the microorganisms concerned in the decomposition of marine algae. The contents of the report are presented under the following headings: I. Director's Report. 1. Introduction. 2. Ecology and Survey. 3. Microbiology. 4. Mechanical Engineering. 5. Process Development. 6. Algal Chemistry. 7. Agriculture. 8. Publications. II. Board of Management's Advisory Committees. III. Staff at 31st December 1952.

"Menhaden...Big Deal in Very Small Packages," by Bill Wisner, article, Fishing Long Island Waters, June 25, 1953, vol. 4, no. 8, pp. 13, 20, 22, illus., printed. Describes briefly the habits of menhaden, gear and methods of fishing, and types of fishing vessels. Also describes the industrial uses of menhaden byproducts and the value of menhaden to the sports fishermen as chum and as whole or cut-fish bait.

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(Michigan). "Fish Division," 46 p., reprint from Sixteenth Biennial Report 1951-1952. The Department of Conservation, Lansing, Michigan. Functions and activities of the Fish Division are described: fishery management, hatcheries, conservation measures, development and maintenance of public fishing sites, and lake and stream improvement. The Institute for Fisheries Research, the research branch of the Fish Division, reports on lake mapping and surveys, stream surveys, age and growth of fish, fish mortalities and disease, sea lamprey, and other investigations. The section on commercial fisheries which pertains to the Michigan waters of the Great Lakes covers the calendar years of 1950 and 1951. Data are presented on the catch and availability of whitefish, lake trout, and other species. Changes in commercial fishing regulations are listed. Statistics for the commercial fisheries of Michigan's waters of lakes Michigan, Superior, Erie, and Huron (including Saginaw Bay) give details on gear, boats, buildings, and catch and value by species and by months.

The Norwegian Klipfish Industry: Nature and Distribution, by Lawrence M. Sommers, 13 p., illus., printed. (Reprinted from Papers of the Michigan Academy of Science, Arts, and Letters, volume XXXVIII, pp. 347-55, Plates I-IV, 1952). Michigan State College, East Lansing, Mich., 1953. The sun-curing of salted fish, which results in a product called "klipfish," is one of the major methods of treating fish in Norway. Cod is used chiefly for klipfish; ling, coalfish, tusk, and haddock are also used. This paper describes the development of klipfish production in Norway, and discusses raw materials, centers of production, nature of klipfish production in Möre og Romsdal County, export of klipfish, and the future of the industry.

North of the Circle, by Frank Illingworth, 257 p., illus., printed, $4.75. Philosophical Library, New York, N. Y. The Arctic Circle—the rim of the world—is the subject of this book. Of particular interest to those interested in fisheries is the chapter on seals and sealing. The author points out: "seals have been hunted on a commercial basis since the first sealers penetrated the polar regions some three centuries ago." Commercial sealing by the leading nations taking part and sealing as conducted by the Eskimo are described. A short explanation of the migrations and habits of the seals is included. Fishing through the ice by Eskimos is mentioned in several places throughout the book. Among some of the other subjects covered are the Russian North, the American North, the Eskimo, and the problems of life in the polar regions.

Observations on Gonad Development, Spawning and Setting of Oysters and Starfish in Long Island Sound, Bulletin No. 1 (June 18, 1953), 3 p., processed. Copies of this and other bulletins in this series available from the Fishery Biological Laboratory, U. S. Fish and Wildlife Service, Milford, Connecticut. Bulletin No. 2 (July 2, 1953), 1 p., also available. As in previous years, the Service's Biological Laboratory at Milford, Connecticut, will issue during the summer bulletins with information that may be of practical importance and interest to the oyster growers of Long Island Sound. These bulletins will describe the progress of accumulation and quantity of spawn in oysters during the prespawning and spawning periods; report on the intensity of spawning of the oyster population at different depths of Long Island Sound; and report on the beginning and intensity of setting in different sections of Long Island Sound. Also included will be information on the survival and rate of growth of recently set oysters, and other facts that may be of interest to oyster culturists, especially concerning the behavior of the oyster enemies, starfish and drills.

Oyster Bulletin No. 1, 1953, 2 p.; and Supplement to Oyster Bulletin No. 1, 1953, 3 p., processed. Chesapeake Biological Laboratory, Department of Research and Education, Solomons Island, Md. This is the first of a series of bulletins containing information relating to the reproduction, growth, and condition of oysters in Maryland waters. Oyster Bulletin No. 1, 1953, presents data on spawning and setting of oysters in Maryland waters to July 2. A short discussion of the objectives and methods of some phases of the Laboratory's oyster research program is presented in Supplement to Oyster Bulletin No. 1, 1953.

The Rainbow Trout in Relation to the Other Fish in Fish Lake, by William F. Sigler, Bulletin 358, 27 p., illus., printed. Agricultural Experiment Station, Utah State Agricultural College, Logan, Utah, February 1953. This paper discusses the limnological and fishery investigations of Fish Lake, Utah, and the life history of the coast rainbow trout, Salmo gairdnerii irideus. It gives a description of Fish Lake, history of the fishery, food interrelationships, fishing success, body-scale relationship, age and growth, length-weight relationship, and management of the fishery.

Report of Marine Borer Conference (sponsored by the William Clapp Laboratory and the Marine Laboratory, University of Miami; at Miami Beach, Florida, June 11-13, 1952). The Marine Laboratory, University of Miami, Coral Gables, Florida, April 1953. Contains texts of 18 papers, some illustrated, which were presented at the second annual Marine Borer Conference. Participants represented the Office of Naval Research, Bureau of Docks, Army Engineers, Department of Agriculture, University of Miami Marine Laboratory, University of Southern California, Yale School of Forestry, and private research agencies and members of industry. Papers discuss problems of deterioration in marine structures of concrete, wood, and steel. Results of experimental preservatives are presented along with design factors affecting deterioration of marine structures. Several papers discuss studies of the life history and physiology of marine borers (shipworms). Although primarily concerned with shoreside installations, much of the information presented will be of interest and value to vessel owners, builders, and designers.

—D. E. Powell

(Scotland) Report on the Fisheries of Scotland, 1952, Scottish Home Department, Fifth Report, 68 p., illus., printed, 2s. 6d. net (35 U. S. cents). Her Majesty's Stationery Office, Edinburgh, Scot-

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land. This is a report of Scotland's fisheries, with statistical data for the year 1952. Contains total production figures by species and by port (both comparative and historical) and information on the number of boats, personnel, and methods of capture. Production and value of lobsters, crabs, and fishery byproducts are also included. Sections are also devoted to discussions of the herring, white fish, and salmon fisheries, marine fisheries law enforcement, scientific investigations, harbor maintenance, and whaling.

"Shellfish Sanitation Program of Massachusetts," by Leo Fox, article, Modern Sanitation, vol. 5, no. 6 (June 1953), pp. 17-19, 68, printed, $2.00 per year in U. S. 855 Avenue of the Americas, New York 1, N. Y. Describes briefly the extensive shellfish sanitation program being carried out by the State of Massachusetts in an attempt to provide a good, wholesome product to the public. The current functions of the program are carried out by two departments of the State Government: the Public Health Department and the Department of Conservation. The functions of the Public Health Department are carried out by the Division of Sanitary Engineering which is concerned with the sanitary conditions in the tidal areas where shellfish are dug and the Division of Food and Drugs which is responsible for sanitary inspections of shellfish shucking and packing plants. In the Department of Conservation, the Division of Marine Fisheries is responsible for opening and closing shellfish areas on the recommendations of the Public Health Department and issuing licenses to master diggers and processing plant operators on the recommendation of the Food and Drug Inspector. The Division of Law Enforcement is responsible for policing closed areas and shellfish processing plants and the apprehension and prosecution of violators. Sanitary surveys are made of all the contaminated shellfish areas in the State. From the results of the survey and the bacteriological analyses of sea water and shellfish, the condition of each area is evaluated and classified as grossly polluted or moderately polluted. If the area is moderately polluted, the shellfish may be dug for purification purposes only. These moderately-polluted areas which are chiefly soft-shell clam areas can be worked only by master diggers. These soft-shell clams must be brought to the shellfish treatment plant at Newburyport, Mass., for purification. Quahogs or hard clams are next in abundance to soft-shell clams and are generally found in clean or open areas. Quahogs dug in moderately-polluted areas must be transplanted to clean areas for self purification. Oysters are not in plentiful supply and are found chiefly in clean areas in the Cape Cod Region. The shellfish treatment plant has been used only for the soft-shell clams. The clams are treated by holding them in chlorinated sea water for a certain length of time, depending upon the original degree of contamination. Licenses to operate are granted only to shuckers, packers, and reshippers who can and do meet the State's requirements. Periodic sanitary checks are made by the State. Out-of-State shellfish dealers who wish to sell their products in Massachusetts must have a certified certificate to operate comparable to the level issued in Massachusetts. The dealers must also be on the U. S. Public Health Service list of approved shellfish dealers. The State of Massachusetts has done and continues to do research work in the field of shellfish sanitation. Methods and processes are continually being improved and modified in the light of newer findings.

—F. T. Piskur

"Small Scale Manufacture of Fish Meal," by T. Sparre, article FAO Fisheries Bulletin, vol. 6, no. 1-2 (Jan.-Feb./March-April 1953), pp. 1-17. Food and Agriculture Organization of the United Nations, Rome, Italy. The report briefly describes small-scale methods of manufacture of fish meal as a means of utilizing fish caught in excess of quantities needed for food purposes. The general principles involved in the preparation of meal from lean and from fat fish are explained. The methods of manufacture described are those involving the minimum of mechanical equipment and the elimination of expensive steam boiler and centrifugal oil separators. These processes would be suitable, therefore, for processing small quantities of fish with a minimum investment for equipment, without the need of highly-skilled technical personnel.

The "miniature" method of manufacture will handle several hundred pounds of fish per day and involves the use of homemade equipment. The method described is essentially a summary of the information contained in Fishery Leaflet 135, "Commercial Shark Fishing in the Caribbean Area," published by the U. S. Fish and Wildlife Service (1945). The basic pieces of homemade equipment needed are the cooker, press, dryer, and grinder.

Two small-scale mechanized processes are described only in general: (1) the simple direct dryer, suitable for lean fish and (2) the indirect cooker-dryer, particularly recommended for fatty fish. In the first method the ground fish are dried in one operation in a flame dryer, after which the scrap is ground, cooled, and sacked. The equipment will handle about 10 tons of raw material per 8 hours. A refinement of this simple method was developed and patented by O. Notevarp at the Norwegian Fisheries Research Institute. The Notevarp process consists in mixing finely divided raw material with dried or partially dried material in such a proportion that the mixture forms a semi-dry product which can be conveniently dried.

The second method, developed by G. Bojner of Sweden, consists of indirect cooking and drying of the raw material. A combined cooker-dryer may be used for lean fish. Separate cooker and dryer with an intermediate press is needed for fatty fish. The oil is separated from the press liquor in settling tanks. These processes will handle 25 tons of fish per 8 hours.

—F. T. Piskur

What Makes a Lobster Shed?, by J. Kenneth Donahue, Fisheries Circular No. 7, 4 p., printed. Department of Sea and Shore Fisheries, Augusta, Maine, May 1951. The lobster must shed its entire shell at intervals before it can grow. Many factors, including age, water temperature, and food supply, determine the frequency of molt. Young lobsters

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will molt as many as 20 times during the first year, but after 4 or 5 years the mature lobster molts but once a year, usually early in the summer. The author describes briefly the problem of molting in lobsters and the problems to be solved if the shedding process is ever to be controlled.

Foreign Market Notes—Fats and Oils

The Office of Foreign Agricultural Relations, U. S. Department of Agriculture, has been studying fats and oils foreign market outlets and competition with United States products in 10 European countries. This study was made under the provisions of the Agricultural Marketing Act. Preliminary findings have been published for each country visited. Some of these reports contain short references to fish and whale oils. The publications issued to date under the over-all heading of "Foreign Market Notes—Fats and Oils" are:

The Fats and Oils Situation in Spain, FFO 3-53, 3 p.
The Fats and Oils Situation in Italy, FFO 6-53, 7 p.
The Fats and Oils Situation in Switzerland, FFO 8-53, 3 p.
The Fats and Oils Situation in Austria, FFO 9-53, 3 p.
The Fats and Oils Situation in Western Germany, FFO 10-53, 5 p.
The Fats and Oils Situation in Denmark, FFO 11-53, 2 p.
The Fats and Oils Situation in the Netherlands, FFO 12-53, 5 p.
The Fats and Oils Situation in Belgium, 13-53, 3 p.
The Fats and Oils Situation in France, FFO 15-53, 3 p.
The Fats and Oils Situation in the United Kingdom, FFO 15-53, 4 p.

Free copies of these "Foreign Market Notes—Fats and Oils" are available from the Foreign Agricultural Service, U. S. Department of Agriculture, Washington 25, D. C. An over-all report summarizing the observations on the European Fats and oils trade shown in these preliminary reports is planned.

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