



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 |
|-------------------|--|
| CFS- 978 | - Florida Landings, January 1954, 6 pp. |
| CFS- 995 | - Maine Landings, April 1954, 3 pp. |
| CFS- 996 | - Massachusetts Landings, April 1954, 8 pp. |
| CFS- 998 | - Mississippi Landings, April 1954, 2 pp. |
| CFS-1000 | - Fish Meal and Oil, April 1954, 2 pp. |
| CFS-1001 | - Texas Landings, April 1954, 3 pp. |
| CFS-1003 | - Imports & Exports of Fishery Products, 1949-1953, 8 pp. |
| CFS-1005 | - Gulf Fisheries, 1952, Annual Summary, 10 pp. |
| CFS-1015 | - Alabama Landings, April 1954, 2 pp. |
| FL - 97 | - Fish Culture as a Livelihood (revised), 3 pp. |
| FL - 254 | - List of Fishery Associations in the United States, Alaska and Hawaii (revised), 13 pp. |
| FL - 293 | - List of Fishermen's and Fish Shore Workers' Unions in the United States, Alaska, and Hawaii (revised), 8 pp. |
| FL - 416 | - Little Tuna Recipes, 6 pp. |
| Sep. No. 373 | - Freezing Gulf-of-Mexico Shrimp at Sea. |
| Sep. No. 374 | - Gulf-of-Maine Bluefin Tuna Exploration--1953. |
| SSR-Fish. No. 121 | - Angling on Little Pigeon River, Great Smoky Mountains National Park, 1953, by Robert E. L Lennon, 30 pp., processed, April 1954. |

Survey of Sport Fishery Projects, 1954, Circular 26, 149 pp., processed, April 1954. This circular is the second annual catalog of sport-fishery programs in the United States. Its objective is to provide fishery administrators, teachers, research workers, and managers a means of keeping abreast of current work in fish conservation and restoration activities.

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

Alaska Fishery and Fur-Seal Industries, 1951, by Seton H. Thompson, Statistical Digest No. 31, 73 pp., illus., printed, 35 cents, 1954. This report was compiled by the field staff of the Branch of Alaska Fisheries and from statistical returns submitted by all fishery operators in Alaska. The statistical material was assembled and tabulated by the Statistical Unit of the Branch of Commercial Fisheries, using for the first time automatic equipment to analyze the fish tickets, vessel registrations, and sworn production reports. Detailed reports and statistical tables concerning the operation and yield of the various fishery industries are presented, with added data on certain related matters, particularly the condition of the fishery resources. Under the section on fishery industries, the following subjects are covered: court decisions; Alaska Department of Fisheries; research; exploratory fishing investigations; administration; management; and general statistics on salmon, herring, halibut, shellfish, and miscellaneous fishery products. The second section on the Pribilof Islands fur-seal industry covers administration, fur-seal population studies, and general statistics on the fur seals taken in 1951. A statement is also included on sealing privileges accorded aborigines.

Laws and Regulations for Protection of the Commercial Fisheries of Alaska, 1954, Regulatory Announcement 42, 60 pp., printed, March 1954, 20 cents.

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.

Age and Growth Study of Tillamook Bay Chum Salmon (ONCORHYNCHUS KETA), by Kenneth A. Henry, Contribution No. 19, 28 pp., illus., printed, Fish Commission of Oregon, March 1954. Describes a study of some of the biological characteristics of Tillamook Bay chum salmon, methods of collecting data, age composition, sex ratio, growth as determined by scale analysis, and comparison with other areas.

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Bulletin of the Japanese Society of Scientific Fisheries, vol. 19, no. 9, 1954, 66 pp., illus., printed in Japanese and summaries in English. The Japanese Society of Scientific Fisheries, Tokyo, Japan. Contains the following scientific papers: "The Metabolism of the Pearl Oyster, Pinctada martensii--I. On the Carbonic Anhydrase;" "Studies on Antisepsis of Fishing Cotton Yarns--I. Antiseptic Coating with Protein Sols;" "Studies on Antisepsis of Fishing Cotton Yarns--II. Antiseptic Treatment with Polyvinyl Latex as the Binder;" "Urea Content and Ammonia Formation of the Muscle of Cartilaginous Fishes--II.;" "On the White Spots Appearing on the Surface of the Seasoned and Dehydrated Globe-fish, 'Hugu-Mirinbosi'--I.;" "Model Experiments on a Sardine Ringnet;" "Studies on Preventing Oxidation of Fish Oils and Fish Products--I. Effects of Butylhydroxyanisole (B.H.A.) on Fish Oils;" "Experimental Studies on the Propagation of the Pearl Oyster, Pinctada martensii--II. On the Unusual High Mortality of Pearl Oyster Caused by Bacteria--I;" "Biochemical Studies on Pearl Oyster, Pinctada martensii--I. Distribution of Glucosulfatase, Phenolsulfatase and Chondrosulfatase in Various Tissues of Pearl Oyster;" "Studies on the Antibiotic Action of Fish Components--V. Influence of the Ingredients of the Medium on the Production of the Antibiotic Action;" and "Ecological Studies on a Clupeoid Fish, Argentina semifasciata."

Bulletin of the Japanese Society of Scientific Fisheries, vol. 19, no. 10, 1954, 78 pp., illus., printed in Japanese and summaries in English. The Japanese Society of Scientific Fisheries, Tokyo, Japan. Contains the following scientific papers: "Animal Protein Factor (APF) and Vitamin B₁₂ in Marine Products--III. Seaweeds (Part 2) and Others;" "Animal Protein Factor (APF) and Vitamin B₁₂ in Marine Products--IV. Variations in the Vitamin B₁₂ Content During Spoilage of Marine Animals;" "On a Method of the Determination of Oxygen Consumption of Fish--I.;" "Studies on a Kind of Discoloration of Fish-Oil--VI.;" "Urea Content and Ammonia Formation of the Muscle of Cartilaginous Fishes--III. The Distribution of Urea and Trimethylamine Oxide in Different Parts of the Body;" "On the Antennule Flagella of the Japanese Spiny Lobster, Panulirus japonicus (v. Siebold), as an Age-Determinant;" "Distribution of Catches of Tuna Long-line--IV.;" "Studies on Fish Curing--III. On the Smoking Conditions Affecting the Quantity of Deprived Formaldehyde;" "Studies on Tagging Experiments with Fish;" "Studies on the Whale Oil--IX. Fatty Acids Composition of the Pacific Beaked Whale (Berardius bairdii) Oil (Part 3). On the Viscera Oil;" "How do Fish Select Positions and Kinds of Bags When Entering Into 'Masu-Ami'?--II. Field Tests with the Sea Bass, Lateolabrax japonicus and Several Other Species;" and "Vitamin A Content in Fish Meat--I. Variation in the Vitamin A Content in Fish Meat by the Anatomical Locality."

(Canada) Journal of the Fisheries Research Board of Canada, vol. XI, no. 3, illus., printed, May

1954. Fisheries Research Board of Canada, Ottawa, Canada. Contains, among others, the following articles: "A Comparative Study of the Yellowtail Flounder from Three Atlantic Fishing Areas," by D. M. Scott; "Tagging Returns, Age Studies and Fluctuations in Abundance of Lake Winnipeg Whitefish, 1931-1951," by W. A. Kennedy; "Some Aspects of Olfactory Perception in Migrating Adult Coho and Spring Salmon," by J. R. Brett and D. MacKinnon; and "The Rockfish Sebastes rubrivinctus in British Columbia Waters," by K. S. Ketchen.

Control of Eel-Grass in Oyster Culture Areas, by A. R. A. Taylor, General Series No. 23, 3 pp., illus., printed. Fisheries Research Board of Canada, Atlantic Biological Station, St. Andrews, N.B., February 1954. A dense growth of eel grass (Zostera marina L.) interferes with oyster culture in the shallow areas of warm summer water in the Maritime Provinces. This circular describes the mechanical removal of eel grass; control by covering with shell, gravel, or sand; and chemical eradication of eel grass. In studies made by the Fisheries Research Board of Canada, the methods of covering in various ways and chemical treatment were found to give extended control of eel grass. Cutting the plants is only a temporary measure since new leaves and branches will soon develop unless the growing points are killed.

Diseases of Fishes of the Western North Atlantic--I. Diseases of the Sea Herring (CLUPEA HARENGUS), by Carl Sindermann and Aaron Rosenfield, Research Bulletin No. 18, 23 pp., illus., printed. Department of Sea and Shore Fisheries, Augusta, Maine, February 1954.

"An Ecological Study of the Gulf of Mexico Fishes, in the Vicinity of Cedar Key, Florida," by George K. Reid, Jr., article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 4, no. 1, 1954, 97 pp., illus., printed. Marine Laboratory, University of Miami, Coral Gables (University Branch) 46, Florida.

Fishery Statistics of the United States 1951, by A. W. Anderson and C. E. Peterson, Statistical Digest No. 30, 341 pp., illus., printed, \$1.50, 1954. Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C. (For sale by the Superintendent of Documents, Washington 25, D. C.) This sourcebook, the latest in a series of annual statistical reports on the fisheries of the United States, Alaska, and Hawaii, contains data on the catch and ex-vessel value of fishery products; employment of persons, gear, and fishing craft in the fisheries; the production and value of manufactured fishery products; and related information. Surveys to obtain data on the commercial catch of fish and shellfish for the year 1951 were conducted in 1952 in all areas of the United States and Alaska except the Mississippi River and its Tributaries. The total catch of fishery products totaled 4,414,045,000 pounds, valued at \$360,826,000 ex-vessel--a decrease of 10 percent in quantity as compared with 1950. Out-

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standing developments during the year were the record landings of shrimp, menhaden, ocean perch, and the marked increase in salmon production. However, these increases did not offset large declines in the catches of such major species as the California pilchard, Maine and Alaska herring, Pacific tuna, and jack mackerel.

The catch of menhaden off the Atlantic and Gulf States during 1951 broke all previous records--1,127,065,000 pounds, valued at almost 13 million dollars ex-vessel. The catch was far greater than that of any other species taken by United States and Alaska fishermen. The Atlantic Coast catch of ocean perch totaled a record 258,320,000 pounds. Shrimp production amounted to over 224 million pounds, valued at nearly 52 million dollars ex-vessel, likewise new records. The 1951 salmon catch in the Pacific Coast States and Alaska was up almost 46 million pounds over the previous year, due mainly to good runs of pink salmon in Southeastern Alaska and Puget Sound. The Pacific Coast pilchard catch amounted to nearly 329 million pounds valued at over 7 million dollars ex-vessel--a decrease of 54 percent in quantity and 40 percent in value as compared with the previous year. The mackerel catch on the Pacific Coast declined from over 133 million pounds in 1950 to less than 89 million pounds during 1951. Tuna production on the Pacific Coast amounted to nearly 316 million pounds as compared with 390 million pounds in 1950. The catch of sea herring on both coasts amounted to only 154 million pounds, compared with nearly 364 million pounds the previous year.

The pack of canned fishery products in the United States and Alaska in 1951 amounted to over 801 million pounds, valued at slightly more than 301 million dollars to the packers--a decrease of 17 percent in quantity and 9 percent in value as compared with 1950. These decreases resulted principally from smaller packs of tuna, California sardines (pilchards), and Maine sardines. The 1951 production of fishery byproducts in the United States and Alaska was valued at over 69 million dollars--9 percent less than in the previous year. Frozen fish production in 1951 was the largest in history, amounting to 326 million pounds.

San Pedro, California, in 1951 continued as the nation's leading fishing port, both as to quantity and value of landings. Receipts at this port totaled over 513 million pounds, valued at nearly 31 million dollars ex-vessel. Other leading ports with respect to quantity were Gloucester (Mass.) 260 million pounds; San Diego (Calif.) 174 million pounds; and Boston (Mass.) 171 million pounds. San Diego with landings valued at nearly 26 million dollars ex-vessel held second place with respect to value; followed by Boston, 14 million dollars; and Gloucester, 13 million dollars.

Fishery statistics of the United States and Alaska are compiled and published annually to make available information on both the economic and biological aspects of the domestic commercial fisheries. Data on the economic aspects

are necessary to persons engaged in the commercial fishery and to governmental agencies concerned with its regulation and protection. From the biological standpoint, these data are important to sound fishery management in providing detailed information on fluctuations in the commercial catch by species, locality, gear, and on the type of gear and craft operated. They assist conservation agencies in regulating the commercial fisheries so as to produce maximum yields without depletion.

--B. E. Finley

(FOA) Monthly Operations Report (Data as of February 28, 1954), 94 pp., illus., processed. Division of Statistics and Reports, Foreign Operations Administration, Washington 25, D. C. Describes the FOA program in Latin America.

"The Genera of Oysters and the Australian Species," by J. M. Thomson, article, Australian Journal of Marine and Freshwater Research, March 1954, vol. 5, no. 1, pp. 132-168, 11 plates, illus., printed. Commonwealth Scientific and Industrial Research Organization, 314 Albert Street, East Melbourne, C. 2, Victoria. A review of the status and nomenclature of the Australian ostreids. Three genera are recognized, Ostrea Linnaeus, Crassostrea Sacco, and Pycnodonte Fischer de Waldheim. Ten native species of Australian oyster and one imported species are described in detail. Two keys to the species are provided, one based on shell characters and one based on the details of the soft anatomy.

"The Impact of Science in the Fishing Industry-II," by Daniel P. Norman, article, Monthly Review Federal Reserve Bank of Boston, vol. 36, no. 2 (February 1954), pp. 7-10, printed. Federal Reserve Bank of Boston, Boston, Mass. New England will be directly affected by innovations now being introduced in the fishing industry. New developments in the fields of textiles, chemistry, refrigeration, and mechanization and their importance for the New England fishing industry are discussed. (Also see Commercial Fisheries Review, June 1954, p. 76.)

The Inshore Scallop Fishery of the Maritime Provinces, by J. S. MacPhail, General Series No. 22, 4 pp., illus., printed. Fisheries Research Board of Canada, Atlantic Biological Station, St. Andrews, N. B., February 1954. The giant or sea scallop (Placopecten magellanicus), which is found along the northwest Atlantic coast from Newfoundland to Cape Hatteras, has become a commercially important species in recent years. In the Maritime Provinces active fisheries have developed in inshore areas in the Bay of Fundy, along the south shore of Nova Scotia, and in the Gulf of St. Lawrence. In the Digby area of the Bay of Fundy boats are built and rigged specifically for scallop fishing which is the principal source of income for many fishermen there. In other areas, where scallop fishing is of lesser importance, the types of boats and gear have been influenced by those used in the more profitable groundfish or lobster fisheries, although other factors including the type of bottom and

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depth of water are of some importance. This circular describes the Bay of Fundy scallop fishery, the type and design of boats used, gear, fishing operations, shucking procedure, and handling of the meats. Variations in gear and fishing methods are also discussed.

(Institute of Seaweed Research) Annual Report for 1953, 48 pp., illus., printed. Institute of Seaweed Research, Inveresk, Midlothian, 1954. The annual Director's report of progress at the Institute on the research and development of the seaweed of the British Isles includes the following principal developments.

Another of the repeated surveys to determine the seasonal and cyclical changes undergone by the *Laminaria* sp. (brown seaweed) sublittoral beds of the Coast of Northern Scotland and adjacent islands was completed. A few of the interesting observations may be cited here. For a specific area the peak of weed growth had been reached between June and August, with a trebling of density between winter and summer. Severe gales in September of one year resulted in the loss of 34 percent of the seaweed in one area and by the following May the bed had not recovered its former density. In one area studied the tidal deposit of seaweed in summer was mainly red seaweed; that for autumn was brown seaweed. Aerial surveys of the extent of seaweed beds in Scottish waters combined with samplings at various depths have enabled the workers to estimate the total quantity of Laminariaceae at 10 million metric tons. Of this amount 39 percent is said to be concentrated in areas covering only 14 percent of the total sublittoral zone from 0 to 10 fathoms along 38 percent of the 5,300-mile coastline of Scotland and the islands studied.

In the field of microbiology of seaweeds, studies reported included attempts to isolate and evaluate the micro-organisms causing the decomposition of stacked weed, the effects of low temperature (23° to 14° F.) on the keeping qualities, and the strains promoting active hydrolysis of seaweed constituents. Work was continuing on the suitability of seaweed and its constituents as a media for the growth of such micro-organisms as the yeasts.

Harvesting equipment developments were mainly on the perfection of a continuous grapnel or belt harvester from the pilot to vessel-operations scale of operations. Structural weaknesses have been observed and corrective designs worked out. Capacities for production reported under experimental test conditions varied from 0.7 to 7 tons per hour, with sea and weather conditions being an important contracting factor.

Suction-type harvesting equipment was studied in scale model in tank experiments to improve the entry to the cut plants into the suction inlet.

It is expected that the use of underwater photography of the harvesting operations will

expedite improvements in both equipment and technique. Studies of limiting weather conditions for use by naval architects in design of seaweed harvesting vessels are a part of the Institute's program.

Observations on process development studies were made to further the extraction of other algal chemicals than the alginic acid now in commercial production, such as L-Fucose and hydroxyethyl Laminaria. Drying of seaweed was tested using thermal, pressure, and plasmolysis methods. Tests of the loss in soluble matter from the cutting of the weed into small pieces for suction harvesting showed that, while bruising is undesirable, cutting is satisfactory.

The chemistry, properties, and extraction of the various seaweed chemicals have been further investigated. Applications to the medical, fertilizer, and soil-conditioning fields are under study as well as the uptake of fission products by seaweed.

Animal-feeding experiments are being conducted using ensiled seaweed and various species prepared as meals for inclusion in diets replacing standard ingredients. Results are quite variable and indeterminate so far. Sheep refused the ensiled weed. Growth response of rats indicates the several constituents of seaweed tested compared generally with starch as energy sources.

A list of the publications of staff members and collaborators totaling some 24 articles in print and 16 in press is included.

--Charles Butler

(International Pacific Salmon Fisheries Commission) Annual Report 1953, 37 pp., and map, illus., printed. International Pacific Salmon Fisheries Commission, New Westminster, Canada, 1954. A report of the Commission, an international agency appointed under a Convention between Canada and the United States for the protection, preservation, and extension of the sockeye salmon fisheries in the Fraser River system. Discussed in this report are the various activities of the Commission during 1953: the regulations, the United States fishery, the Canadian fishery, Indian catch statistics, escapement, the 1954 cycle, rehabilitation of barren areas, and general investigations. Includes a map showing distribution of sockeye spawning grounds in the Fraser River watershed.

Introduction to Trawling, by A. Hodson, 63 pp., illus., printed. Published by the author, 80 Spring Bank, Grimsby, England, 1953. This new edition of one of the standard reference books on trawling contains complete descriptive and illustrative material on the North Sea otter trawl. Six chapters include specifications and photographs describing the otter trawl, trawl accessories, running gear, procedure for working otter trawl, hauling, net making and net-mending. One of the most valuable items is a two-page detailed drawing of a North Sea trawl

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(Vignerón Dahl type), showing otter door hook-up, Dan Lenos, bobbins, beackets, floats, floppa, cod line, etc. The difference between beam trawls and otter trawls is explained. The types and sizes of netting used in the various parts of the trawl are described, as are such accessory items as otter boards and back strops, ground ropes, tickler chains, bobbins (wood and iron), belly lines, head lines, beackets, bridles and pennant wires, and quarter ropes or chains. Complete procedure for shooting and hauling is given. The final chapter concerns net making and net mending and is amply illustrated with photographs of the various steps involved. Besides being of interest to those readers not familiar with this type of fishing gear, the book should prove to be a valuable reference manual for experienced fishermen, researchers, and students of fisheries.

--D. E. Powell

Investigations of Mortalities to Downstream Migrant Salmon at Two Dams on the Elwha River, by Dale E. Schoeneman and Chas. O. Junge, Jr., Research Bulletin No. 3, 51 pp., illus., printed, State of Washington Department of Fisheries, Seattle 99, Wash., April 1954.

"Like to Be a Frog Farmer?" by B. Bruce Barnum, article, Reclamation Era, June 1953, vol. 39, no. 6, pp. 118-119, illus., printed, Bureau of Reclamation, U. S. Department of the Interior, Washington 25, D. C. A brief description of the successful operation of a frog farm near Orland, Calif. Describes the construction of frog-breeding ponds, characteristics of the frog, and its feeding habits.

The Live Bait Shrimp Fishery of the Northeast Coast of Florida, by Donald P. de Sylva, Technical Series No. 11, 35 pp., illus., printed, Florida State Board of Conservation, Tallahassee, Florida, 1954. Describes an investigation, undertaken by the Marine Laboratory of the University of Miami for the Florida State Board of Conservation, to study biological and economic aspects of the live-bait shrimp fishery of the northeast coast of Florida. The sport fishery of the area depends to a large extent on live shrimp as bait. Three species of shrimp are included in the fishery. The relative importance of these varies with locality, as does the method of fishing. The complex life history of the white shrimp is outlined. It is emphasized that the female bait shrimp species does not carry its eggs attached to its body and that the small shrimp caught in the bait fishery with egg masses on the abdomen are a different species. Also, the bait shrimp do not spawn in the shallows, but offshore in deep water. The economic importance of this industry is shown by the shrimp sales in these areas from July 1952 to July 1953, which amounted to nearly \$700,000. It is estimated that about 1,300 people make their living solely from the shrimp industry from Oak Hill to Jacksonville Beach. Catches, prices, and other economic data pertaining to the industry are presented. Methods of holding and transporting live shrimp are described. Included in

this project were studies on the fishery methods and gear and the identification of shrimp and fishes caught. The two principal gears used are the push net and the dip net. In addition, cast nets and trawls are employed. Each of seven shrimp-producing areas on the northeast coast of Florida is considered in relation to the important species of shrimp it produces, the gear used, the catch composition, and the ecology of the area. The catch composition of push net catches is presented. Few fish of sports or economic importance are caught. The author believes that the push nets (and other gear) have little or no harmful effects on the shrimp or fish stocks or on the habitat, and that the law prohibiting the use of push nets was not justified on the basis of conservation or economics.

Manual of Recommended Practice for Sanitary Control of the Breeding and Freezing of Shellfish, 31 pp., processed, U. S. Department of Health, Education, and Welfare, Public Health Service, Division of Sanitary Engineering Services of the Bureau of State Services, Washington, D. C., 1954. The U. S. Public Health Service has, at the request of state and local health authorities, exercised supervision over the sanitary quality of shellfish shipped in interstate commerce. As its part of this joint operation each shellfish-shipping State adopts laws and regulations, conducts surveys for compliance, and issues yearly numbered certificates to shellfish dealers who comply with the minimum sanitary standards. The Public Health Service, on its part, reviews the State control program and rates a representative number of the shellfish processing plants. States whose control programs are acceptable are endorsed. A periodic compilation of all shellfish shippers who have been certified by the recognized State shellfish-control authorities is released by the Public Health Service for the information and guidance of the consuming public.

The manual just released is used by the Public Health Service to outline the acceptable sanitary practices in the rating of shellfish-breeding plants. There are other manuals used as guides for other phases of shellfish shucking and packing operations. (Shellfish herein refers only to edible oysters, clams, and mussels.)

The sanitary requirements which a shellfish-breeding plant must meet, in order to be certified by a State for inclusion by the Public Health Service in the compilation of certified shellfish shippers, are described under four major categories: (1) plant and equipment requirements; (2) plant personnel; (3) plant operation; and (4) packaging, identification, and refrigeration of product.

Each of the principal components of the plant buildings and equipment used is listed as a subheading. The acceptable condition and type is set forth. The Public Health reason for the requirement is clearly given. Detailed specifications titled "Satisfactory Compliance" complete the discussion of each item. For example there is to be found the following under the subheading:

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"Screening. When flies are present, rooms used for breeding, frying, or packing of shellfish, and/or the washing of utensils, shall have all openings screened, unless other effective means are provided for preventing the entrance of flies.

"Public-Health Reason: Flies may contaminate the shellfish with disease organisms, thus nullifying the effectiveness of all other public-health safeguards.

"Satisfactory Compliance: This item will be satisfied when:

- (a) All openings are effectively screened whenever flies are present.
- (b) Other means provided to prevent the entrance of flies are effective.
- (c) Screen doors open outward and are self-closing.
- (d) No flies are present."

The plant personnel section deals with: prohibition of employment to persons having communicable disease; and responsible supervision for compliance with plant, personnel, and operational cleanliness.

The plant operation section stresses the source and condition of shellfish and breeding material; the storage and use of batter and breading mixture; paper containers; the cleaning and bactericidal treatment for equipment; and special conditions for prefrying equipment.

Section four deals in the same manner with acceptable packaging, labeling, and refrigeration procedures, equipment, and conditions. For example, under "Refrigeration of Breaded Shellfish" there is stipulated: (1) that at no time during processing may the temperature of the product exceed 50° F.; and (2) that the packaged product must be transported promptly to the freezing room; and (3) that a temperature of 0° F. or lower is to be maintained in the cold-storage room. Some of the "satisfactory compliance" items under this same subheading include: (1) breaded shellfish are packaged and placed in the freezing room within 45 minutes after breading; (2) each freezing and cold-storage compartment is fitted with at least an automatic temperature control, a properly located indicating thermometer, a chart-type recording thermometer so installed as to record accurately the ambient air temperature at the warmest parts of the compartment, and these charts retained for at least one year after use for reference if needed.

--Charles Butler

"Marine Bait-Worms--A Maritime Industry," by J. S. MacPhail, article, Progress Reports of the Atlantic Coast Stations, No. 58, April 1954, pp. 11-17, illus., printed in English and summary in French. Fisheries Research Board of Canada, Ottawa, Canada.

"Marine Electrical Fishing," by W. Dickson, arti-

cle, World Fishing, vol. 3, no. 4, April 1954, pp. 148-151, printed, illus. John Trundell (Publishers) Ltd., London, England. This article, written by a member of the Marine Laboratory, Torry, Aberdeen, presents a brief but interesting account of the experiments to date in electrical fishing for marine fishes. A description, with appropriate figures, of the nature of electrical fields in fresh and salt water is given, and the process by which fish are paralyzed or attracted to the anode (electrotaxis) is explained. Some background on electrical fishing research, especially since the war, is provided for the benefit of those not intimately familiar with the subject. The problems involved in marine electrical fishing are emphasized. It is pointed out that roughly 50 times as much power is required in salt water than in fresh water for the same physiological effect on the fish. This is due to the much greater conductivity of salt water and to the boundless expanse of the sea. In recent years the Germans have been foremost in the development of marine electrical fishing devices and techniques, including a tuna shocking device and an electrical fishing apparatus with two electrodes adaptable to such possible uses as trawling. Experiments are now under way in the United Kingdom on (1) laboratory tests on the reactions of fish to a range of electrical stimuli, and (2) small-scale electrical fishing in the sea. The author concludes by pointing out that despite many limitations and unsolved problems there is hope that electrical fishing apparatus may be developed for use as a marine-research tool and, in some cases, as commercial fishing gear. Much of the article is too technical to have a great deal of meaning to those untrained in electrical engineering, but the average reader who has an interest in fisheries research will find it of value as an up-to-date picture of the subject. A short bibliography is included.

--D. E. Powell

(Oregon) Fish Commission Research Briefs, vol. 5, no. 1, 38 pp., illus., printed. Fish Commission of Oregon, Portland 1, Oregon, March 1954. Contains the following reports on some of the current studies of the Commission: "Population Limits of the Silver Salmon Run in Tillamook Bay During the 1951 Fishing Season," by Raymond A. Willis; "The Toxicity of Zinc or Cadmium for Chinook Salmon," by Wallace F. Hublou, James W. Wood, and Ernest R. Jeffries; "The 1951 Alsea River Chinook Salmon Investigation," by Alfred R. Morgan and F. C. Cleaver; "The Length of Time That Silver Salmon Spent Before Death on the Spawning Grounds at Spring Creek, Wilson River, in 1951-52," by Raymond A. Willis; and "Third Progress Report on Spring Chinook Salmon Diet Experiments," by Ernest R. Jeffries, Thomas B. McKee, Russell O. Sinnhuber, Duncan K. Law, and T. C. Yu.

Shellfish With Certificates, 4 pp., printed, 5 cents each, \$1.50 per 100 copies. Public Health Service, Department of Health, Education, and Welfare, Washington 25, D. C. (Sold by Gov-

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ernment Printing Office, Washington, D. C.) This small 4-page pamphlet is primarily designed to show the consumer that certified shellfish are the ones to look for and buy. It will be useful for wholesalers to supply to retailers or enclose with packaged shellfish, or for retailers to distribute to their customers.

The Selective Action of Gillnets on Fraser River Sockeye Salmon, by Alvin E. Peterson, Bulletin V, 101 pp., printed, illus. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada, 1954. As part of the Commission's rehabilitation program for Fraser River salmon, a study of the selective action of linen gill nets was undertaken in 1947 and 1948. Selectivity for size, age class, sex ratio, and numbers of sockeye salmon was determined, which indicated the selectivity of the commercial fishery at that time. Of the four types of fishing gear used on Fraser River sockeye (purse seines, gill nets, traps, and reef nets), United States fishermen use primarily purse seines and Canadian fishermen use mainly drift gill nets. The mesh size of the gill nets is not restricted, ranging from about $5\frac{1}{4}$ to $6\frac{1}{2}$ inches stretched mesh. The depth of the gill nets is limited to 60 meshes, and the length is restricted to 150 fathoms in the river above Garry Point and 200 fathoms below the Point outside the river. The gill net boats vary in length from about 26 to 38 feet, setting and hauling the gear from the stern roller. Experimental fishing from two chartered boats was carried out on the closed weekends during the 1947 and 1948 season using 10 different mesh sizes of gill netting ranging from $5\frac{1}{4}$ - to $8\frac{3}{4}$ -inch mesh. A total of 6,521 sockeye were thus caught. Data on lengths, depths, widths, weights, sex, and scales were collected from these salmon. The nets were measured to determine exact mesh sizes and extent of shrinkage. The average shrinkage varied from $1/32$ to $4/32$ of an inch in the various meshes, practically the entire shrinkage occurring in the first three weekends of fishing. Results showed that the nets were highly selective for size, age group, and sex ratio of the salmon. The larger meshes caught mostly larger sockeye with males in the majority, while the smaller meshes caught mostly small fish with females predominating. There was an approximate linear relationship between mesh size and fish length. It was concluded that the indicated selectivity for the larger sizes of sockeye by the gill-net fleet from the 1946 and 1948 Chilko River population was apparently related to the mesh-size distribution fished by the fleet. The gill nets caught larger fish than those caught by nonselective purse seines. A test showed that, had the fleet mesh distribution on the 1948 Chilko run been similar to the mesh experiment, size selectivity would have been avoided. The percentage of males were found to be much lower in the escapements to the various Fraser River spawning grounds when fished by gill nets in the late run. When protected by early special closures of the gill-net fishery, escapements approximated a 1:1 sex ratio, but were unbalanced in favor of females about 1:2 when fished intensively by gill nets. The report

is illustrated with charts, graphs, and tables. A literature review of Fraser River gill-net selectivity is included.

--D. E. Powell

Some Observations on Extraction and Iodine Values of Fat from Fish Tissue, Press Cake and Meal, and on Peroxide Values of Meal Fat the First Day, by Pall Olafsson, 12 pp., illus., printed in Icelandic and English. (Reprinted from Timarit Verkfraeingafelags Islands, vol. 38, no. 4). The Icelandic State Herringoil and Meal Factories, Siglufjordur, Iceland. Results are presented of a study of the spontaneous heating of fish meals. All fish meal investigated was found to heat spontaneously the first day after production. The rise of temperature in the center of 100-kilo jute bags was found to be $5-40^{\circ}$ C. Extraction of fat from fish tissue, press cake, and meal is discussed. Beside extracting different quantities of fat from herring meal, the solvents were found to extract fat with variable contents of nitrogen. Nitrogen content of extracts was found to be 0.85-4.0 percent. Differences in iodine values of fat from press cakes and meals as determined by the Hanus method and the modified Rosenmund-Khuhenn method were found up to 25 units. Only slight differences were found in fat from fresh and deteriorated herring and rosefish. Peroxide values of meal fat were found to be highly variable. They were found to increase greatly on the first day after production from very low values in meal leaving the drier. Peroxide values of meal fat are also highly dependent upon to what extent the meal is dried. They increase rapidly when the meal is dried to below 10- to 12-percent moisture. Much higher values for peroxide content were found in fat from meal conveyed pneumatically than not conveyed. Meal was found to take up oxygen spontaneously on the first day.

Survey of Food and Nutrition Research in the United States of America 1952-53, 372 pp., processed, \$1.75. Prepared by the Food and Nutrition Board, National Research Council. Published by the U. S. Department of Agriculture, Washington, D. C., April 1954. (Sold by the Superintendent of Documents, Government Printing Office, Washington 25, D. C.) The survey was carried out by the Food and Nutrition Board of the National Research Council and financed by a contract with the U. S. Department of Agriculture. It lists research projects which were active during part or all of the period between July 1, 1952 and June 30, 1953. The personnel associated with, and the organizations supporting and/or conducting, the reported research are given. Included is a section devoted to new problems and unsolved problems of long standing submitted by contributions to the survey who felt that these were of particular urgency in the food and nutrition fields. The data represents a survey of all organizations known to be active in food and nutrition research, including public and private educational institutions, State and Federal governmental departments and agencies, State experiment stations, the food industry, food trade organizations, and foundations making research grants-in-aid.

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The major headings of the Table of Contents lists: I. Research Projects; II. Titles for Suggested Research; III. Personnel Index; IV. Organization Index; V. Subject Index to Research Projects; VI. Appendix.

--F. T. Piskur

Technical Report of Fishing Boat No. 3, 234 pp., illus., printed in Japanese with 12 pp. of English abstract. Fishing Boat Laboratory, Production Division, Fisheries Agency, 2-2 Kasumigaseki, Chiyoda-ku, Tokyo, Japan, July, 1952. This report contains 12 articles presenting results of the studies and investigations made in the Fishing Boat Laboratory during the 1951 fiscal year. In a brief introduction, Keigo Inamura, laboratory chief, explains that the function of the laboratory is to improve, through research, the economic position of the fishing industry, stimulate its development along sound lines, and increase the welfare of the fishermen who man the vessels. Fishing boat research was begun by the Fisheries Agency in fiscal 1948, and the present laboratory was established in the Production Division in 1950. The laboratory has four branches: General Affairs, Hull Study, Engine Study, and Nautical Surveying Instruments Study. A table briefly presents results of the various studies undertaken in the years 1948-52. The various articles deal with "Experimental Results on Actual Ships by No. 2 Type Torsionmeter;" "Study in Insulation of Fish Holds;" "On the Out-line of an Experimental Boat Compromising Japanese and Foreign Type;" "On the Trail Performances of the Japanese Type Experimental Boat Akatsuki;" "On the Characteristics of Water Proof Laminated Wood;" "Experimental Results of Ship Forms;" "Wearing of Cylinders of Fishing Boat Engines;" "Study on Magnetic Compass Bowl;" "An Example of Durability of Magnetic Compass Bowl;" "Catch Gauge for Two Boat Trawler;" "Experiments on Manufacturing of Remote Control Towing Thermometer for Mid Water;" and "Study on School Finder." Most of these experiments are of a continuing nature, but some valuable and interesting results have been obtained to date. It was found that the simplest and most effective method of preventing or reducing wearing of cylinders in engines of fishing vessels is by the application of chrome galvanization to the cylinders. An experimental catch gauge for two-boat trawlers was developed, after tank tests and practical experiments, to reveal the catch in the net during trawling operations, as well as mud or accidents to the net. Fairly good results were obtained with an experimental remote-control towing thermometer for giving immediate temperature readings at depths up to 70 meters. This instrument was developed mainly for the tuna fisheries and oceanographic observations.

--D. E. Powell

Technical Report of Fishing Boat No. 4, 173 pp., illus., printed in Japanese with brief English abstract. Fishing Boat Laboratory, Production Division, Fisheries Agency, 2-2 Kasumigaseki, Chiyoda-ku, Tokyo, Japan, 1953. This report

presents, in 9 articles, the results of experiments and investigations carried out by the Fishing Boat Laboratory in 1952. Most of the articles report further on work which was discussed in the previous report (Technical Report of Fishing Boat No. 3). One new article describes the development of an improved "marine Aneroid barometer." On large ships, marine mercury barometers are used to check the Aneroid barometers, which are subject to various errors. But mercury barometers cannot be widely used on fishing vessels. Therefore, a marine Aneroid barometer was manufactured by the laboratory, successfully tested, and found to have the following characteristics: (1) high accuracy and sensibility; (2) negligibly small inclination error, temperature error, acceleration error, and friction error; (3) hardly an error caused by the lapse of time, and good reliability; and (4) needle very stable in vibration. It is predicted that this new marine Aneroid barometer may completely replace the marine mercury barometer. It may also be used on land for general meteorological observation.

--D. E. Powell

"Whaling on the Coast of British Columbia," by Gordon C. Pike, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), March 1954, no. 3, pp 117-127, illus., printed in Norwegian and English. Norsk Hvalfangst-Tidende, Sandefjord, Norway. A brief history of the British Columbia whaling industry. Also includes catch statistics, trends in the species composition of British Columbia catches, and processing methods. According to the author, "The future of the whaling industry on the coast of British Columbia is optimistic. In post-war years catches have shown a steady increase in numbers, and complete and efficient utilization of the raw material is being realized. Competition from vegetable oils and petroleum products, and high labor costs, are being compensated for by utilization of products other than the oil. The use of meat for animal food and possibly for human consumption gives promise of a successful future. With continued conscientious biological study in compliance with international whaling requirements it should be possible to recognize signs of depletion of any species should they occur, and to take steps to remedy the situation before serious damage is done."

Food and Agriculture Organization

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These reports have not been published on a sales basis, but have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization, Viale delle Terme di Caracalla, Rome, Italy.

Report to the Government of Finland on the Possibilities for Fishery Development, FAO Report No. 72, 31 pp., and 5 plates of photographs, processed, January 1953. Describes the fish-

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eries of Finland; the administration and administrative problems of the Finnish fisheries; and recommendations for organization, management,

and research. Contains a bibliography of papers dealing with the Finnish fisheries.



DEVEILED CLAMS AN EXOTIC ENTREE

Clams in the shell are sold by the peck, dozen, or quart. Out of the shell, or shucked, they are sold by the pint or quart. They are also available frozen or canned.



Clams should be alive when purchased in the shell. If the shells hold tightly together, the clam is alive. If the shells are slightly parted, tap the clam gently and it will close tight if it is alive.

Clams are most frequently eaten raw, steamed, or in chowder, but many exotic main dishes use clams as the feature ingredient. The home economists of the U. S. Fish and Wildlife Service suggest "Deveiled Clams." Served with tomato wedges, they are an attractive and appetizing entree.

DEVEILED CLAMS

- | | |
|-------------------------------------|---|
| 1 pint clams | 1/4 teaspoon thyme |
| 1 clove garlic, minced | 3 drops tabasco sauce |
| 2 tablespoons chopped onion | 1 tablespoon chili sauce |
| 1/2 cup chopped celery | 1 egg, beaten |
| 1/4 cup butter or other fat, melted | 1/2 cup cracker meal |
| 1 tablespoon flour | 2 tablespoons chopped parsley |
| 3/4 teaspoon salt | 2 tablespoons butter or other fat, melted |
| 1/4 teaspoon pepper | 1/2 cup dry bread crumbs |

Drain and chop clams. Cook garlic, onion, and celery in butter until tender. Blend in flour and seasonings. Add clams and cook until thick, stirring constantly. Stir a little of the hot sauce into egg, add to remaining sauce, stirring constantly. Add meal and parsley. Fill 6 well-greased individual shells or casseroles. Combine butter and crumbs; sprinkle over top of each shell. Bake in a hot oven, 400° F., for 10 minutes or until brown. Serves 6.