



"Fisheries Biology: A Study in Population Dynamics," by D. H. Cushing, Univ. of Wisc. Press, 1968, 216 pp., illus., \$7.50. As the demand for food grows with the rapidly increasing world population, the measurement of the quality and extent of the world's fisheries becomes more important. Dr. Cushing describes methods by which fish stocks may be measured, conserved, and properly exploited. He stresses quantitative methods of measurement and application of mathematical concepts to fishery biology. He examines in detail methods of determining average age of different stocks, and the relationships of migrations and ocean boundaries to each other, and to the biology of fisheries.

"The Biology of Estuarine Animals," by J. Green, Univ. of Wash. Press, 1968, 401 pp., illus., \$9.50. The configuration of land and water at the meeting of a river and the sea was once crucial in the evolution of man, and is still the habitat of countless animal species. Mr. Green investigates the physico-chemical characteristics of a brackish sea environment, the vegetation that provides food and shelter, and the ways in which estuarine animals cope with their surroundings.

"Fishing with Electricity: Its Applications to Biology and Management," Fishing News (Books) Ltd., London, 1968, 304 pp., illus., £3 12s. 6d. The book contains the two-part proceedings of a symposium sponsored by the Food and Agriculture Organization in 1966. It offers the conclusions of an internationally integrated study on the application of electricity to inland fishery biology and management. The first part, a report on recent basic research on the electrophysiology of fish, summarizes present knowledge of electric fishing methods and gear. The second part, 14 papers studied by the symposium, is divided into sections covering the electrophysiology of fish, electric fishing practice, electric screens and guides, the electronarcosis of fish for handling, and an annotated bibliography of Soviet literature on electric fishing.

"The Farming of Fish," by C. F. Hickling, Pergamon Press, New York, 1968, 88 pp., illus., \$3.50. Fish farming, a practical application of limnology and freshwater biology to food production, is exciting much interest in parts of the world where it has not been common practice. Drawing on his own experience, C. F. Hickling, former Fisheries Adviser to the Colonial Office, has written a concise and informative text on fishpond management. It includes short discussions of the basic elements of fish farming, water quality and supply, pond soil, fish pond biology, stocking and species, and fish farming in the sea.

"Ocean Engineering," edited by J. F. Brahtz, John Wiley & Sons, New York, 1968, 720 pp., illus., \$17.95. Believing that an engineering systems approach is required to manage the complex marine environment, the editor and 16 contributors have tried to relate social, economic, and military needs to common technological goals. The environmental aspects and technological goals of marine development are dealt with in chapters on general features of the ocean, hydrodynamics, biology, law, economics, social and military needs, and systems development planning. Other chapters cover on-site technology of deep ocean installations, fixed and mobile structures, marine vehicles, instrumentation, manned operations and work systems, materials selection, testing, and environmental simulations. This book will interest planners concerned with engineering technology applied to the marine environment. Technical managers will find particularly useful the treatment of opportunities for matching social, economic, political, and military needs with existing and potential technology.

"Marine Fishes of New Zealand," by Jim Moreland, illustrated by Eric Heath, A. H. & A. W. Reed, Wellington, 1968, 56 pp., illus., \$2.25. This simple reference book for the fisherman or amateur ichthyologist identifies,

and illustrates in color, every fish likely to be taken in New Zealand waters. The common Maori, and scientific names, salient characteristics, diet, habitats, and methods of catching are given for each species.

"Preliminary Review of Alternative Federal Measures of Encouraging Private Investment Enterprise in Marine Resource Development," by Miller B. Spangler, Clearinghouse, Springfield, Va., 22151, 1968, \$3.00. The demands of a rapidly growing population for food, chemicals, metals, energy, and freshwater leave no doubt that marine resources will have to be developed sooner or later. At present, conventional technology for farming, dredging, and mining land areas is so developed that exploitation of the oceans is not commercially competitive. Oceanics is a world in which the public interest may require new kinds of government-business cooperation. This National Planning Association report reviews more than 50 Federal measures that might stimulate private investment to develop marine resources.

Surveys of the marine science activities of 99 nations have been published by the National Council on Marine Resources and Engineering Development. The surveys describe the economic importance of marine activities to each country, the nature and scope of marine research, and the mechanisms for coordinating ocean endeavors. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, "Marine Science Activities of the Nations of the Near East and South Asia" is 35 cents, "East Asia," "Latin America," and "Africa" are 35 cents each, and "Canada and Europe" is 55 cents.

"An Oceanographic Curriculum for High Schools," by Robert Taber, Leon LaPorte, and Esworth Smith, 1968, 30 pp., 35¢, Superintendent of Documents, GPO, Washington, D. C. 20402. Prepared by scientists of the National Oceanographic Data Center, the booklet briefly outlines a flexible program of lectures covering various areas of oceanography. Some subjects are "Man and the Sea," "Food from the Sea," "Air-Sea Interaction," "The Continental Shelf," "Limnology," "Conservation," and "Origin of the Oceans."

"Wire Angle Tables," adapted by John E. Throck, Cornell Maritime Press, 1968, 104 pp., \$5.00. These tables, adapted from Bow-

ditch, Table No. 3, should be a great help to oceanographers, marine biologists, fishermen and navigators. By providing instant solutions as the angle changes, they eliminate lengthy computations. They also offer an accurate method of estimating how much wire to pay out to reach a given depth for fishing or trawling, and for checking the accuracy of mechanical accumulators and tension meters.

"Mechanized Haul Seine for Use in Farm Ponds," by Kenneth L. Coon, Alfred Larsen, and James E. Ellis, FIR Reprint 57, Fish and Wildlife Service, Dept. of the Interior, 1968, pp. 91-108, illus. Available free from Branch of Reports, Publications Unit, BCF, 1801 N. Moore St., Arlington, Va. 22209. Present methods of harvesting fish from farm ponds are time consuming, laborious, and wasteful. The mechanized haul seine makes it possible to harvest fish from large undrained ponds, keeps fish ready for short-notice market requirements, maintains high quality even for live transfer, and cuts operating costs. This paper describes the design and operation of a mechanized haul seine and conveyor system developed to capture, load, and weigh fish into trucks for shipment. The seine works well in ponds ranging from 4 to 50 acres, and in water as deep as 8 feet.

"Operation of North Atlantic Type Otter Trawl Gear," FL-445, by Boris O. Knake, 15 pp., illus. Available free from Branch of Reports, Publications Unit, BCF, 1801 N. Moore St., Arlington, Va. 22209. Rigging, crew stations, and step-by-step operating instructions are fully illustrated and simply explained.

"Effect of Special Handling of Haddock on the Postirradiation Shelf Life of Haddock Fillets," by Vincent G. Ampola and Louis J. Roncivalli, FIR Preprint No. 58, Fish and Wildlife Service, Dept. of the Interior, 1968, 3 pp. Available free from Branch of Reports, Publications Unit, BCF, 1801 N. Moore St., Arlington, Va. 22209. The shelf life of haddock fillets can be doubled or tripled by proper irradiation. This is a report on special handling used to prolong shelf life, and tests used to determine quality of irradiated haddock fillets.

"Observations on the Physiological Ecology of Marine Fungi," a lecture by Samuel P. Meyers, Contribution No. 878, Institute of Marine Sciences, Univ. of Miami, pp. 207-225, illus. (reprinted from Bulletin of Misaki

Marine Biological Institute, Kyoto Univ., no. 12, Feb. 1968). Mycological aspects of marine microbiology are of considerable interest to scientists concerned with microbial transformation of complex substances in the sea. Dr. Meyers comments on the experimental aspects of Ascomycetes and Deuteromycetes, many of which attack wood, developed in the laboratories of the Institute of Marine Sciences over the past ten years.

"Ecology and Growth of Juvenile Tarpon, *Megalops atlanticus*, in a Georgia Salt Marsh," by William L. Rickards, Contribution No. 869, Institute of Marine Sciences, Univ. of Miami, 1968, pp. 220-239, illus. (reprinted from "Bull. Mar. Sci." vol. 18, no. 1, Mar. 1968). The tarpon Valenciennes undergoes metamorphosis from a leptocephalus larva to a juvenile much the same as the eel *Anguilla rostrata*. After reaching the shore, or shortly after moving into salt-marsh drainages, the larvae metamorphose. The next period of their lives is spent in marsh pools and creeks. This study was made to determine some of the relationships between the young tarpon and the biotic and abiotic environmental factors during this period.

"Studies of Phytoplankton Ecology in Tropical and Subtropical Environments of the Atlantic Ocean. Part 2. Quantitative Studies of Phytoplankton Distribution in the Straits of Florida and Its Relation to Physical Factors," by Gabriel Vargo, Contribution No. 866, Institute of Marine Sciences, Univ. of Miami, pp. 5-60, illus. (reprinted from "Bull. Mar. Sci.," vol. 18, no. 1, Mar. 1968). Until 1957, the majority of phytoplankton studies along the eastern coast of the U. S. were limited to northern waters. This is a quantitative study of the phytoplankton in the Straits of Florida and the effects of physical parameters upon its vertical and seasonal distribution.

"The Complete Larval Development of the West Indian Hermit Crab *Petrochirus diogenes* (L.) Decapoda, Diogenidae) Reared in the Laboratory," by Anthony J. Provenzano, Jr., Contribution No. 867, Institute of Marine Sciences, Univ. of Miami, pp. 143-181, illus. (reprinted from "Bull. Mar. Sci.," vol. 18,

no. 1, Mar. 1968). More information concerning the development of hermit crabs has been gathered during the last decade than in all the preceding years. This account of the complete zoeal development and the glaucothoë of *Petrochirus diogenes* summarizes morphological features of the zoeae and glaucothoës as presently known, and offers some limited ecological data derived from the rearing experiments.

"The Atlantic Coast Surf Clam - with a partial bibliography," by Robert M. Yancey and Walter R. Welch, Fish and Wildlife Service, Dept. of the Interior, Circular 233, 1968, 14 pp., illus. Available free from Branch of Reports, Publications Unit, BCS, 1801 N. Moore St., Arlington, Va. 22206. The surf clam supports an important commercial fishery along the Middle Atlantic coasts. This pamphlet summarizes the fishery's history, biology, commercial handling, processing, and marketing.

"Shell Opening by Crabs of the Genus *Calappa*," by John B. Shoup, article in "Science," May 24, 1968, vol. 160, no. 3833, pp. 887-89, illus. Decapod crustaceans of various groups open mollusk shells to feed on the soft parts. The most refined shell opening mechanism yet discovered has been found in oxystomatous crabs of the subfamily Calappinae. The article is illustrated with some remarkable photographs.

"Pontellid Copepods as Indicators of Oceanic Incursion Over Georges Bank," by Kenneth Sherman and Everett Schaner, "Ecology," Spring 1968, vol. 49, no. 3, pp. 582-84, illus. Warm surface water has been observed at various times over the southern part of Georges Bank. Previous studies have shown that pontellids are abundant in the surface waters, and that several species are limited to discrete types of water. To supplement physical oceanographic data on the movements of the warm waters, and to delineate the region of faunal change between coastal and oceanic waters, the authors have examined the distribution of pontellid copepods collected during one of the incursions.

--Barbara Lu

