

The History of Marine Fisheries

Publication of "**The Provident Sea**," by D. H. Cushing, has been announced by Cambridge University Press, 32 East 57th Street, New York, NY 10022. At first, the title may appear to be a recitation of oceanic productivity; in reality, the volume is a fine review of the history of the exploitation of the ocean's marine fisheries resources (including marine mammals as well as finfishes), and the study and management of them, from ancient to modern times.

The author begins with reviews of fisheries and gear in prehistoric times and antiquity, leading into a well-illustrated discussion of the pre-industrial fisheries of Europe, North America, and India. Chapters are then devoted to the cod fishery off Newfoundland between 1502 and 1938 and the North Sea herring fishery from the 1100's to recent times. A chapter on the first industrialization of fisheries and the move from sail to steam power relates the effect of the industrial revolution on English fisheries, industrialization of North Sea fisheries and evidence of stock decline, mackerel and menhaden fisheries along the U.S. Atlantic coast, and the Pacific halibut fisheries. A longer chapter reviews whaling history and its decline. Two more chapters assess the harvest of the Pribilof Islands fur seals and the harp seals in Newfoundland.

The author then moves into the origins of marine biology and fisheries science, in which he relates the early work of early scientists, the ICES before WWI, early collection of fisheries statistics, etc. He then discusses the work prior to WWII of various institutions/commissions (ICES, North Pacific Fur Seal Commission, International Fisheries Commission, and the International Pacific Salmon Commission). Then he reviews the work of those and newer fishery institutions between 1945 and 1965.

The author considers the "second industrialization" of fisheries to have been between about 1950 and early 1977—up to the inception of the 200-mile limits, and including the rise of distant-water fishing operations by various nations, exploitation of various fishes for fish meal, use of stern trawlers, rising demand for frozen fish, etc. Finally he discusses marine fisheries research and management in the last 20 years. Some may quibble a bit about the emphasis here on particular early scientists or the choice of examples, but this remains an excellent history of marine fisheries resources, fish stock management, the industrialization of fisheries, and the evolution of fisheries research and the institutions involved. Indexed and with a lengthy list of historical references, the 329-page hardbound volume is available from the publisher at \$65.00 per copy.

Toward A History of American Fisheries

"**A Century of Fisheries in North America**," edited by Norman G. Benson and published in 1970 by the American Fisheries Society, 5410 Grosvenor Lane, Bethesda, MD 20814 as AFS Special Publication No. 7, is still available from the Society. The volume, which marked the Centennial of the Society, presents many authoritative chapters on the history of America's freshwater and marine fisheries. And while many of the chapters could easily be expanded to book length, they do provide excellent, documented accounts of the history of important American fisheries, their management, and strides in fisheries research and education. In sum, it is an excellent record of America's fisheries progress and is a good reference for a wide variety of people

(i.e., historians, fisheries scientists, and others interested in tracking the course of America's fisheries.

In addition, it is a history of an important professional society and its record in the field of fisheries research and management. AFS history has been divided into the first and second 50-year periods. Trends in fishery research are explored and the history of American fish culture is examined in relation to development of fishery programs and warmwater pond culture. Management of individual species is reviewed for the Pacific sardine, herrings, Pacific halibut, Pacific salmon, tunas, northwest Atlantic groundfishes, oysters, and clams. Several appendices provide considerable background information on AFS officers, annual meetings, editors, publications (which themselves constitute an impressive historical record of fisheries achievement), and much more. For a one-stop reference on the history of American fisheries, this publication is excellent. References of historic note or interest are given for each chapter. Although the publication was published in 1970, such historical material never goes out of date; in fact, much of it was written by authors with personal insight into the various programs. The 330-page hardbound volume is available from the Society for \$8 (member price) and \$10 for nonmembers.

Toward A History of Mariculture

Publication of "**A History of Marine Fish Culture in Europe and North America**" by R. Kirk has been announced by Fishing News Books, Ltd., 1 Long Garden Walk, Farnham, Surrey, England. The author is with the Fisheries Directorate General staff of the European Economic Community in Brussels, Belgium. This is a very good review of the rise of mariculture, primarily in Europe, including brief mention of some efforts in antiquity. Unfortunately, there is much less mention of U.S. marine fish culture, outside brief references to salmonid culture in the Pacific Northwest and Alaska.

Mariculture history in Europe, though,

is much more detailed and provides an interesting and instructive description of developments from the fish lagoons of Comacchio on the Adriatic Sea to flatfish culture and Norwegian salmon ranching. In addition, the author discusses the origins of fish hatcheries for the culture of marine fishes, mass liberations of marine fish fry (and opposition to it), fish culture in the Arcachon fish reservoirs of France, attempts at increasing production by fertilizing Swedish sea lochs, etc. Also discussed is post-war (WWII) flatfish culture, mullet culture, eel culture, salmon and trout farming, and work with such other species as pompano, striped bass, dolphinfish, tuna, and sturgeon.

In examining the many successes and failures, the author has produced an interesting historical look at a growing field. All species discussed, of course, are finfishes; shellfishes such as mollusks and crustaceans will have to await another historian. Even though North American developments are not well represented, the book still gives a useful history of concurrent events in European research and development. The book contains numerous references, a glossary, list of species mentioned, and an index. Paperbound, the small-format 192-page volume costs \$12.50.

A New Journal of Aquatic Reviews

Publication of "**Reviews in Aquatic Sciences**", a quarterly, multidisciplinary review journal, has been announced by CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, FL 33431. Editors of the new journal are Robert R. Stickney of the University of Washington, Seattle; Michael J. Kennish of GPU Nuclear Corporation, Forked River, N.J.; and Robert S. Anderson of the Chesapeake Biological Laboratory, Solomons, Md. In addition, they have an editorial board of about 32 other experts in various aspects of the aquatic sciences.

The first issue, 1(1), presents two fine historical reviews: "Historical development of marine fisheries management," by William F. Royce and "The history and future of aquaculture in the United States" by Nick C. Parker. Royce reviews evidence from ancient times onward regarding the exploitation and husbandry of fishery resources, the beginnings of the concepts of conservation and of fisheries science, discusses fish culture, acceptance of population theory, and the emergence of marine fishery conservation during 1950-80. In addition, he assesses some of the failures and successes of fishery management

and discusses some of the problems and opportunities that lie ahead.

Parker describes important developments in the U.S. culture of finfishes during several periods: Prior to 1900, 1900-1945, 1945-1960, 1960-1987, and, with that as a background, views the future of aquaculture, noting errors in prior estimates of aquaculture growth, the constraints on fish farming, and areas of potential for expansion.

Other reviews in the issue describe biochemical adaptation to the deep sea, effects of environmental pollutants on early fish development, benthic boundary layers of estuarine and coastal environments, tests for predicting carcinogenicity in fish, and others. Reviews anticipated for succeeding issues will include such topics as susceptibility of U.S. estuaries to pollution, carotenoid deposition and metabolism in salmonids, effects of dioxins and dibenzofurans on aquatic animals, potential effects of water transport on the walleye pollock fishery in the Gulf of Alaska, marine placers, aeration systems in aquaculture, channel catfish nutrition, and more. Subscription price is \$130 per volume, and early issues average about 7-8 articles each, providing good useful syntheses of research and developments in the aquatic sciences.

ATLANTIC SALMON IN NORTH AMERICA

"**The Atlantic Salmon in the History of North America**" by R. W. Dunfield has been published by Canada's Department of Fisheries and Oceans as Canadian Special Publication of Fisheries and Aquatic Sciences 80, and it is an excellent source of information on the early history of the species. Following a brief but good overview of the Atlantic salmon and man, beginning with Pliny's time, the author discusses *Salmo salar* in North America under primeval conditions and then its precolonial fisheries. The species was a primary food source for many Native Americans as well as the early settlers, and it also constituted an important source of income for early commercial fishermen.

Next, he relates the early colonial fishery from 1604 to 1713 and the conditions of, and those affecting, the fisheries between 1713 and 1760, eventually ending his historical account in the year 1867. The author covers the efforts to protect the salmon, negotiate treaties, enact conservation measures, etc., and documents the few positive measures as well as the problems that have led to the species' sad decline. He also outlines the salmon's role in international fishing rights disputes—no small matter in days of yore. The Atlantic salmon, of course, was a more important resource in early America, and this fine history of its discovery, exploitation, and the environmental and other problems that have caused its great decline, should provide some insights into the steps that must be taken if the species is to be restored.

Along the way, the author has provided some interesting and entertaining reading.

Appendix A presents historic methods used to preserve and pack salmon; Appendix B lists Canadian catch and export statistics for the species. Also provided is a lengthy bibliography, and the book itself could be a good model for those who want to write a thorough history of other species and their fisheries. The 181-page paperbound volume is sold by Supply and Services Canada in Ottawa K1A 0S9 for \$11.94 in Canada or \$14.35 to other countries.

Salmon Fisheries of Alaska and Canada

"**Alaska's Salmon Fisheries**," written and edited by Jim Reardon, was pub-

lished by Alaska Geographic as vol. 10, no. 3 by the Alaska Northwest Publishing Company, 130 Second Ave. S., Edmonds, WA 98020. (Another in this series, but unfortunately out of print, is "The Silver Years of the Alaska Canned Salmon Industry: An Album of Historical Photos," vol. 3, no. 4.)

Following an introduction to the species of Pacific salmon found in Alaska, the author introduces the various types of fishing gear employed to harvest them, past and present, and discusses how they work and how much salmon they take. That is followed by another section on the fisheries themselves, discussing each of the state's thirteen fishing regions and districts and the fisheries in each of them. Data for much of that is from 1973-82, although some historical data is provided as well. For Cook Inlet, however, the author presents a rich look at the history of that salmon fishery and its management.

Well written and illustrated, the author/editor has provided an interesting look at one of the nation's important fisheries. The photographs and fish-catch charts, all in full color, are excellent and greatly enhance the interest of the publication. The 128-page softcover volume is available from the publisher for \$12.95 (\$15.50 in Canada).

"**Pacific Salmon**" by R. J. Childerhose and Marj Trim has been published by Douglas & McIntyre Ltd., 1615 Venables Street, Vancouver, B.C., in cooperation with the Department of Fisheries and Oceans Canada (Pacific) and the Canadian Government Publishing Centre, Supply and Services Canada. It is aimed more toward the general reader, though it is soundly based on and reflects the studies conducted by DFO and University of British Columbia scientists and managers. In addition, it is supported by more than 100 superb color photographs by the second author, along with about 90 detailed line drawings by Joey Morgan and species paintings by Harry Heine.

The book begins with a chapter on the history of the Pacific salmon and human uses of them, from Native Americans (the "Salmon People") to early explorers, settlers, and commercial fishermen. Included are details on early efforts at

salmon culture, regulations, and management. Additional chapters examine thoroughly salmon biology, each species' environment, and the methods devised to enhance their status, including genetic research, spawning channels, hatcheries and transplants, lake enrichment, stream engineering, fishways, aquaculture, and more. Well designed and illustrated, but lacking an index and literature citations, the large 158-page volume has been reissued in paperback, and provides an interesting look at important sport and commercial salmonids of the west coast, with most emphasis on British Columbia stocks and studies.

A Century With the Pacific Halibut

The Pacific halibut, *Hippoglossus stenolepis*, fishery in the northeast Pacific turned 100 years old in 1988 and one of the best sources of information on it is "**The Pacific Halibut, the Resource and the Fishery**" by F. Heward Bell, published by Alaska Northwest Publishing Company, 130 Second Ave. S., Edmonds, WA 98020. Bell is a former director of the International Pacific Halibut Commission and his lively, historical narrative is amply illustrated with many period photographs from a variety of fishermen, fisheries organizations, and historical societies.

The author, who spent 45 years with the IPHC, has presented an exhaustive and intimate look at an important commercial and recreational species. He begins with a look at the historic origins of the name halibut, over which there has been some controversy, and then moves to describe the fishery, from aboriginal operations and treaty claims to the sailing fleets, steamers, schooners, etc. along with the fishing methods. Also described are the preservation methods, the halibut ports, and their landings.

Another chapter describes the organizations involved in the halibut industry and their origins and leaders, as well as the international agreements that impinged upon the halibut fishery and halibut management and research. An entire chapter is devoted to the halibut

commission, IPHC, itself. Other chapters discuss net fishing for halibut, fleet programs for orderly marketing, halibut caught incidentally in nets and in the salmon and black cod fisheries, law enforcement and violations, IPHC halibut research, and the sport fishery for Pacific halibut. Finally, an overview chapter summarizes some notable items of interest to the fishery that are not highlighted elsewhere in the volume. Other items of interest are the 18 brief biographical sketches of a number of scientists, administrators, fishermen, etc., who either contributed directly to or affected the halibut and its research or industry. Paperbound, the 267-page volume is available from the publisher for \$19.95 (\$24.95 in Canada).

El Niño, Overfishing, and Peru's Anchovies: A 30-Year Record

Publication of "**The Peruvian Anchoveta and Its Upwelling Ecosystem: Three Decades of Change**," edited by D. Pauly and I. Tsukayama, has been published cooperatively by the Instituto del Mar del Peru (IMARPE), Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), and the International Center for Living Aquatic Resources (ICLARM), MC P.O. Box 1501, Makati, Metro Manila, Philippines.

The authors and editors have here assembled and analyzed an immense amount of monthly time series data on the oceanography, biology, and fisheries of one of the world's most productive ecosystems. Presented are new results, especially as regards the role of the El Niño episodes, and all of the raw data used to obtain the interpretations and results are made available to researchers by ICLARM on 5¼-inch microcomputer diskettes to allow others to utilize their own models and test their own hypotheses with what is probably the most comprehensive data set assembled on the Peruvian upwelling ecosystem.

In all, the book presents its findings and results and interpretations in 19 contributions by scientists from six nations (including three important ones by scientists with the NMFS Southwest Fish-

eries Center). The papers are grouped into four sections: Oceanographic and atmospheric conditions, dynamics of the anchoveta stocks, dynamics and energetics of anchoveta predators, and syntheses—managing the Peruvian anchoveta ecosystem.

The collapse of the Peru's anchoveta fishery from over 12 million t in 1970 to less than 2 million t in 1973 has often been attributed to the 1971-72 El Niño event; however the analysis of a large body of data here finds overfishing to be the main culprit—considering the initial buildup of the guano birds and subsequent crash, the increase of seal populations, decline of the bonito and upsurge of the sardine, etc.

The book should be of interest to oceanographers and fisheries biologists, as well as those involved in work on sea birds and seals. Hardbound, and with species, geographic, and author indexes, the 351 page volume is available from ICLARM (in US\$) at US\$17.50 (surface mail) and \$36.00 (airmail; airmail is recommended by ICLARM). In the United States, it is available from International Specialized Book Services, P.O. Box 1632, Beaverton, OR 97075 at the airmail price of \$36.00, and in Germany from TRIOPS (Tropical Scientific Books), Raiffenstrasse 24, D-6070 Langen, FRG.

THE REAL VALUES OF WILD CREATURES

The value of wild natural resources to human well being is often taken for granted, even though such things are included as fishes, seaweeds, forests, wildlife, and the like. Putting all of it into perspective, however, is "**The First Resource, Wild Species in the North American Economy**" by Christine Prescott-Allen and Robert Prescott-Allen and published by the Yale University Press, 92A Yale Station, New Haven, CT 06520, in cooperation with the World Wildlife Fund.

The book is probably the first scholarly and systematic analysis of the economic importance of "wildlife" to North America, both today and in the past, though it will be of interest to

many others besides just economists. Here, the term "wildlife" or "wild species" is used in its broadest sense to include not only wild game animals, but game fishes, commercial fishes, fur-bearers, creatures for the pet trade, forests, bees, and other plants that may or may not be domesticated, including seaweeds, and marine and terrestrial species used or studied for medicinal purposes.

The authors have reviewed and analyzed much data from agricultural, aquacultural, medical, industrial, trade, and recreational sources in providing a comparison of the contributions of both wild and domesticated species to the total resource supply of a highly developed economy. In addition, they have evaluated the contributions of "wildlife" to the supply of foods and raw materials, compared past and current rates of domestication of wild species as new crops or livestock, and have included data on the wild species utilized in the United States for medicinal purposes.

In addition, the authors evaluate the contribution of the wild genetic resources to current crop production and estimate the value of crops that depend on wild insects for pollination. Also reviewed are the esthetic or recreational uses of wild creatures—that is, such so-called "nonconsumptive" uses as whale watching, wildlife photography, etc. For example, the order of preference of Americans (likes and dislikes) shows trout and salmon ranking 6th and 7th, whale and walrus at 16th and 17th, and the shark on the dislike end of the scale at 26th just behind the skunk.

Following the analyses, the authors present a "biogeography of wildlife use," in which they strive to apply the economic values learned to determine the most important ecosystems, economically, and identify the main sectors using the wildlife associated with the particular ecosystems. They conclude, with three generalizations, that 1) the use of wildlife in general is highly predictable (there is little that is truly new), 2) but in specific terms, predictability is low (a computer probably will not tell us which species in which ecosystem will be the next "miracle" food or medicine), and 3) sudden change in socio-

economic conditions can drastically alter the future of a resource for good or ill. Data on marine fishes are included in chapters on recreational wildlife uses and fishing, in which they assess landings, values, imports, and industrial products of the United States.

Clearly, wild things are of great value to U.S. society; over several thousand years we really have not gotten far removed from our traditional reliance on the original sources of foods, furs, fibers, fuels, medicines, etc., though we have certainly learned to turn them into a multitude of new forms. Readers will find that the book puts the U.S. utilization of wild creatures into a unique and useful perspective and it should give a far better appreciation for their true values. Indexed, the 529-page hardbound volume costs \$62.00.

Ancient and Modern Fish Harvest Methods

The third and greatly expanded edition of "**Fish Catching Methods of the World**," by Andres von Brandt, has been published by Fishing News Books Ltd., 1 Long Garden Walk, Farnham, Surrey, England. It is almost double the size of the original 1964 edition, and the author discusses how fishes can be caught, in the broadest sense. Its 31 chapters review and thoroughly illustrate fish catching methods from stone age techniques to the most modern gear and techniques, although much of it is devoted to an extensive review of essentially small-scale or artisanal fishing methods.

Following a brief introductory chapter, the author relates means of hand gathering fishes; diving techniques of men and women; using various animals such as horses, birds, porpoises, etc., to harvest fish; stupefying fish; fishing with spear, harpoon, arrow, etc.; and the use of clamps, tongs, rakes, and wrenching gear. The author also reviews basic line fishing implements; gear and methods of line fishing; sport fishing gear; fish attraction methods including lures, lights, chemicals, etc.; gaffs, fish harrows, and jigs; natural and artificial

shelters; mechanical traps and snares; fish trapping with permanent and temporary barriers, traps, pots, etc.; and catching jumping fish.

Several chapters deal with a wide variety of nets and netting; Scoop nets, trawls and trawling, seines and seining,

surround nets, lift nets, cast nets, gill-nets, entangling nets, making nets, and much more. Another chapter discusses fishing rituals and religious beliefs and another is presented on fishing systems and harvesting machines. An appendix classifies the various types of fish catch-

ing methods, and the bibliography lists 690 literature citations.

Well illustrated with 733 drawings and photographs, the 418-page hardbound volume is an extensive and thorough review of global fish harvest methods, and costs £27.60.

The History, Resources, and Use of Georges Bank

The Georges Bank region has figured importantly in marine affairs for literally hundreds of years—for whales, for cod, certainly, and many other finfishes and shellfishes—and now, potentially, for oil. Science in the region is much more recent; Charles Wilkes produced the first chart based on an organized survey in 1837. Fisheries research dates from 1870's, but sputtered a bit after the death of Spencer F. Baird in 1887. W. Redwood Wright divides the research in this important area into five different periods between the middle 1800's and the present—and all are thoroughly and excellently covered in “Georges Bank,” an immense, scholarly, and thorough treatise edited by Richard Backus and published by The MIT Press, 55 Hayward Street, Cambridge, MA 02142. The collective scholarship, reviews, and editing that have gone into this huge book seem almost without parallel. The many authors are well established scientists—the NMFS Woods Hole Laboratory personnel (and others) are well represented—and the contributions are authoritative and well written. The mechanics—illustrations, layout, design, color reproduction, printing, and binding—are excellent. The writing and editing are superb; and even though much of the material is technical, jargon has been minimized, so the book is very readable, in fact enjoyable, in most parts.

Alone, the historical chapters in this volume would make a wonderful book.

They include an introductory historical review of scientific research on Georges Bank by W. Redwood Wright, and the region's cartographic history between 1524 and 1850. Then, in section III, “The Fisheries,” is Andrew German's fine history of the area's early fisheries (1720-1930), Richard Hennemuth's history of fisheries conservation and management there, and Keith Smith's discussion of the fishing vessels and gear used in New England between 1930 and 1983.

In addition, there are shorter contributions on dory fishing on Georges Bank—R. Wayne Anderson's condensation of oral histories given him by four former dorymen and schooner captains; Donald W. Bourne's pictorial review of some of the important Georges Bank fishing vessels; and fisherman James P. Ostergard's personal reminiscence, “My First Trip on Georges Bank,” about his trip asea during the 1973 New Bedford strike aboard an old eastern-rigged 80-foot dragger named the *Blue Sea*. And a short article by Backus describes “Death on Georges Bank,” the many hazards faced by the early commercial fishermen. In another short contribution, he explores, historically, the question, “Does Georges Shoal Ever Dry?” In yet another vignette, Barbara B. McCorkle tells “How the Bank Got Its Name,” noting that the first reference to it was on the 1611 manuscript map listing it as “S. Georges Banck.”

Socioeconomics of the New England

offshore fishery are also reviewed and discussed in section III. Other chapters relate the Canadian fishery in the Georges Bank region and the U.S.-Canadian boundary dispute. Another article reviews and compares Canadian and U.S. fisheries administration and management and the implications for the Georges Bank area. Bradford E. Brown reviews the Georges Bank fishery resources and provides synopses of the major species, along with an interesting table summarizing the pertinent data for each species (i.e., geographic range and stock structure, growth at age, age range in fished populations, recruitment, maturity, natural and fishing mortality, and much, much more. Other important chapters discuss fish population dynamics and the future for fisheries management on Georges Bank.

Section IV gets to the crux of the matter—the conflicting uses that the region may be subjected to—and provides perspectives on the petroleum potential on Georges Bank, potential problems with petroleum development and the fisheries resources, effects of drilling effluents on marine organisms, etc. Also examined are environmental protection programs, the politics of oil drilling, and the exploratory drilling done in 1981-82—eight dry holes. Another article discusses marine surface traffic problems.

Additional important chapters relating directly to fisheries resources are presented in section II, “Biology,” which is subdivided into “Phytoplankton, Primary Production, and Microbiology” and “Zoology and Secondary Production.” Most of the chapters here would be of at least some, if not considerable interest to fisheries professionals. It leads off with articles on phytoplankton and primary production, nitrogen cycling, microbiology, zooplankton life cycles, zooplankton pro-

duction and the fisheries of the north-eastern shelf, and benthic fauna and its variability and production. Other chapters review and discuss fishes and squids of the region and their distribution and production; the large pelagic predators (i.e., large tunas and sharks), sea turtles, sea birds, and the whales, dolphins, and porpoises of the region. Also discussed is the production on Georges Bank as compared with other shelf ecosystems. Two final chapters in this section discuss water circulation on the Bank and its biologic implications and a simulation of some physical and biologic interactions.

Part I, however, "Physical Science," sets the stage for the book. Articles here review what is known about the Bank's geology, weather and climate, physical oceanography, and chemistry—made all the more useful and interesting owing to recent and extensive work, and the section is well illustrated with many underwater color photographs.

The U.S. decision to lease sites for oil and gas exploration off the northern New England coast brought a great increase in research funding for the area and studies by many different scientists and institutions. As an outgrowth of the concerns of the oil/fish resource controversies, many studies were begun. The WHOI set up in 1979 a Coastal Research Center for broad-based multidisciplinary studies of the marine ecosystem that includes the Georges Bank, and one of the questions for which an answer was sought was "Why is Georges Bank so productive?"

The result was this book, a most ambitious project, and it should be something of a benchmark in marine science publishing for a long time. Hardbound and indexed, the huge 593-page volume also lists the authors and reviewers and their addresses. Another publisher might have opted to break the book into four or five parts and charged \$50-100 each. The MIT Press, however, chose to publish the entire treatise under one cover with a price of \$225, steep for one volume, but considering the content and utility of it, not out of line. It is certainly an excellent reference for libraries, and probably not a few individuals will want their own personal copy.

U.S. Fisheries in the Northeast Pacific

A revised edition of "**Fisheries of the North Pacific**," subtitled "history, species, gear, and processes," by Robert J. Browning has been published in paperback, with the same large format, by the Alaska Northwest Publishing Company, 130 Second Ave., S., Edmonds, WA 98020. The result is a huge and well written documentary which provides a sweeping overview of the primary American fisheries of this important region. In preparation, the author received considerable help from persons directly involved with the commercial fishing industry and industry journals, as well as from fisheries experts from the then-named NMFS Northwest Fisheries Center in Seattle, Wash.

Section by section, the author describes the fish and fisheries of the region, its commercial fishing vessels and the fishing gear, fish handling and preservation at sea and ashore, the salting and smoking of fish, seafood canning,

and more. Appendices provide data on the characteristics of fishes, names of fishes, tapering purse seines, cutting web tapers, how to plan and cut nets, methods of net mending, handling and icing fresh halibut aboard vessels, sanitary operation of fish processing plants, operations involved in canning, and spoilage in canned fishery products.

The volume is huge, at 423 pages, and each section provides a wealth of historical information, along with many excellent photographs, some old and some illustrating newer vessels, gear, or processes. Considerable information is also presented on some of the fishery pioneers of the region and their work too.

In sum, this is an excellent overview of the region's fisheries, thoroughly illustrated, which has proven very popular since the first edition was released in 1974. It also gives an idea in several areas where research by the NMFS fore-runner, Bureau of Commercial Fisheries, and its findings were successfully employed by the industry. The book is available from the publisher for \$24.95 (\$29.95 in Canada).

California Fisheries and Their Management

"**The Fisherman's Problem**" by Arthur F. McEvoy, subtitled "Ecology and Law in the California Fisheries, 1850-1980," has been published by the Cambridge University Press, 510 North Avenue, New Rochelle, NY 10801. McEvoy, Associate Professor of History at Northwestern University, analyzes, from an historic perspective, the most important fisheries of California in terms of the development of public policy. In doing so, he has provided a unique synthesis of information from such fields as marine biology, ecology, law, economics, and anthropology.

The author reviews the various ways that humans have harvested and managed California fishes, beginning with the fisheries and fishery management of the Native Americans and the early settlers and immigrants. In addition, the mechanization of the fisheries is discussed, along with the interaction of

fishery biology and politics and the inception and work of various fisheries commissions or committees. He also provides a look at some of the personalities involved and their contributions, as well as the successes and failures in managing and developing the State's fishery resources.

In a sense, the author has presented an overall history of the California fisheries as a "laboratory example" of the complex, interrelated problems that face many fisheries elsewhere. He also chronicles the fisheries' sometimes violent ups and downs and the clashes between different groups of fishermen. In the end, the author does not make any specific recommendations for future fisheries policy. While not all may agree with all of his interpretations or selection of examples, the strength of the book lies in its synthesis and examination of historical resource utilization, past policies, societal and political pressures, and their effects on the fisheries. Appendices give climate records for

1853-1980 and the standing crops from 1800 to 1970 of three coastal schooling fishes (Pacific sardine and mackerel and northern anchovy). Extensive notes and a bibliography are included. Indexed, the hardbound 368-page volume is available from the publisher.

A Look at Maine's Lobster Fishermen

Publication of "**The Lobster Gangs of Maine**" by James M. Acheson has been announced by the University Press of New England, 17½ Lebanon Street, Hanover, NH 03755. The author, a professor of Anthropology and Marine Studies at the University of Maine at Orono, here melds the results of several different field studies of commercial lobster fishermen conducted over some 15 years into an insightful look into the interactions and operations of a tight-knit maritime community.

Following a general discussion and history of the fishery, the author moves into a discussion of kinship and community—the relationships and interactions between the citizens and their local towns and the problems of "outsiders" in moving into and integrating into the established community. Another chapter looks at the "lobster gangs," the fishermen themselves and their interactions via cliques, friendships, relatedness, social hierarchy, etc., and the flow of information between fishermen, leadership within the harbor gangs, and entry into the harbor gangs.

Also discussed are lobster fishing territories and tricks of the trade—the value and learning of skills, and innovation and responses to changes in the fishery. Another chapter explores markets and marketing for the lobstermen, and another examines fishermen's attitudes toward regulations. An appendix discusses economic and biological benefits of territoriality in the fishery.

In sum, the author refines and clarifies some of the idealized views of Maine lobster fishermen and their industry. The author also describes various government and industry efforts to prevent overexploitation in the lobster fisheries, and discusses various common-property issues.

The 197-page volume (\$9.95 paper, \$20.00 cloth) is available from the publisher and provides an interesting and enlightening view of an important New England fishery. Besides the interest in the fishery per se, his discussions of common property resources and interrelationships between fishermen will broaden the interest in the volume.

Commercial Fishing and Small Fishing Boats

"**Working the Water, The Commercial Fisheries of Maryland's Patuxent River,**" edited by Paula J. Johnson, has been published by The University Press of Virginia, Box 3608, University Station, Charlottesville, VA 22903, in cooperation with the Calvert Marine Museum. It presents an excellent local maritime history and its importance to the local economy, along with a fine illustrated catalog with detailed descriptions of over 150 items from the museum's collection of commercial fisheries artifacts. Johnson is curator of Maritime History and Folklore at the Calvert Marine Museum in Solomons, Md.

The book begins with G. Terry Sharer's review, "The Patuxent Fisheries: Transformations of a Rural Economy, 1880-1985," of an important commercial fishing area. Two more chapters discuss the watermen themselves and the oyster shuckers and their work over the many years. The remainder of the book is the catalog of artifacts which are grouped by fishery (fishing, soft-shell clamming, eeling, and crabbing and oystering—the largest section), which in turn, is organized along the seasonal fisheries work.

The illustrations and photographs are excellent and the supporting text is likewise ample and descriptive, often showing how the implements or nets are used. Also included is an inventory of the Commercial Fisheries Collection of the Museum, a bibliography, and an index. Many of the implements were, of course, made by hand—the traps, pots, crab gauges, and even the boats, and the book will also be of interest from not only a historical but sociological point

of view as well. The 256-page volume costs \$35.00 (cloth) and \$19.95 (paper) and provides a human dimension to the region's marine fisheries history.

Those interested in the history of Chesapeake Bay commercial fishing will also find "**The Watermen of the Chesapeake Bay**" by John Hurt Whitehead, III, of interest, though for different reasons. Published by the Cornell Maritime Press, Inc., P.O. Box 456, Centerville, MD 21617, it is a beautifully photographed documentary of life on the water.

The text is spare, but reflects the words of the watermen themselves and enhances the generally excellent photographs of a unique way of life that, in some ways, has changed little in decades. It is more of a coffee-table type photo book, but one that accurately portrays the rough, and sometimes difficult, way of life of the commercial fisherman, crabber, oysterman, etc., and it would be an interesting companion volume to the other historical treatises on Chesapeake Bay commercial fishing. Hardbound, the 168-page volume presents nearly 200 full-color photos, and costs \$24.95.

Providing a somewhat different approach to maritime history is "**On the Water,**" by Douglas Alvord, subtitled "The Romance and Lore of America's Small Boats," and published by the Yankee Books division of Yankee Publishing Inc., Dublin, N.H. The author is also an accomplished artist and has illustrated the volume with sketches and paintings of many of the vessels that were so important in many of our early marine fisheries.

The author begins with an explanation of the basics of small boat design and construction, and has produced a well-illustrated history of America's small working boats, beginning with Native American canoes and the similar small craft patterned after them by early immigrant boat builders. Another chapter discusses the early sporting vessels called guide boats—vessels utilized by hunters, trappers, and guides. Other chapters review the various boats used by east coast lobstermen, Chesapeake bay watermen, commercial and sport hunters of waterfowl, flat-water sail

boats (sharpies for oystering, catboats, etc.) and a variety of others, i.e., skiffs, dinghys, dorys, and rowboats. Listed are some of the shops that still make such vessels in the old-fashioned ways and their tools and materials. Another section lists maritime museums and collections and a short bibliography. Indexed, the hardbound volume is available from the publisher for \$24.95.

"Sou'West & By West of Cape Cod,"

authored by Llewellyn Howland and originally published in 1947 by Yankee Books, Dublin, NH 03444, has now been republished 40 years later. And the tales provide a classic evocation of New England's turn of the century shore and seafaring, from about Point Judith to the head of Buzzard's Bay.

New England has a great tradition of marine commerce and the author has sketched some well-written stories to

evoke an era that few now recall. The tales are of whalers, fishermen, shore-workers, boats, boatyards, boat races, and family life. While there is some controversy over how much of the work is fiction and how much is fact, the book nonetheless depicts very well the flavor and atmosphere of the region and its marine heritage and traditions. Hardbound, the 191-page volume is available from the publisher for \$12.95.

History of the U.S. Department of Commerce

"From Lighthouses to Laserbeams, A History of the U.S. Department of Commerce" 1913-1988 edited by Helen Bowers and dedicated to the late Commerce Secretary Malcolm Baldrige, has been published by the Department's Office of the Secretary. It is an excellent little guide to one of the smaller but important Departments, and the parent Department for the National Oceanic and Atmospheric Administration and its National Marine Fisheries Service. Indeed, the NMFS predecessor agency was in the Commerce Department early on, was later placed under the Interior Department, and once again in 1970 was reorganized under NOAA and back in the Department of Commerce.

The author begins by examining the Department's true beginnings over 200 years ago, or at least those of some of the agencies that preceded it—its roots, if you will. As Secretary C. William Verity notes in his Introduction, the story "... begins in the chaotic post-Revolutionary time when the independent states were attempting to establish commercial ties and carries us to the trade and technology challenges of the United States today. In the years between we see how the charts and predictions of the oceanic and atmospheric services, the data of the Census Bureau, the science of the National Bureau of

Standards, the inventions monitored by the Patent Office, the assistance offered by the business development divisions, and the reports and recommendations of the domestic and international trade agencies played an increasingly important role in the national marketplace and the international marketplace."

Indeed, such agencies as the Federal Trade Commission, the Federal Communications Commission, the Federal Aviation Administration, and the Department of Transportation all developed from bureaus in the DOC.

Part I of this interesting book describes the origins between 1776 and 1913 and its evolution from 1914 onward, relating the many agencies formed under it or transferred into or out of it, along with many of the advancements and activities of the Department.

Part II provides a legislative overview, with a year-by-year look at the most significant legislative or organizational changes from 1903 to 1987.

Part III, "Building for the 21st Century" relates the history of the various agencies or administrations within the Commerce Department, who they are, what they do, and how and when they arrived. The NMFS predecessor agency, the Bureau of Fisheries, for example, was placed in the new Department of Commerce and Labor on 1 July 1903,

where it remained until transfer to the Interior Department in 1939. Subsequently, it was renamed the NMFS during the NOAA inception and placed under that agency and back in the Commerce Department in 1970.

Part IV reviews each of the Commerce Department Secretaries and part V describes the Herbert Clark Hoover Building and related historical data on it. Finally, a number of literature sources are given for further information. All in all, the small 117-page paperbound volume provides a lot of sound and interesting information to commemorate the Department's 75th anniversary. It is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325 for \$3.50 (Stock No. S/N 061-000-00712-1).

U.S. Coast Guard Through the Years

"Guardians of the Sea, History of the United States Coast Guard 1915 to the Present" by Robert Erwin Johnson has been published by the Naval Institute Press, Annapolis, MD 21402. As a review and narrative history of another maritime Federal agency, it is an excellent source of information, primarily on the agency's leadership and its primary missions—search, rescue, patrol, and enforcement. Its only shortcoming here is a lack of information on its modern role in fisheries patrols and enforcement, although some may have been a bit too recent for the author to include. Still, it does contain information on the agency's work in protecting fur seals and

Alaska salmon fisheries from poaching in the earlier part of the century, saving or rescuing fishermen from sinking vessels, ice patrols, etc. And, overall, the work is a fine and interesting sequel to "United States Coast Guard, 1790-1915: A Definitive History" by Rear Admiral Stephen Hadley Evans.

The author describes the merger of the "Life-Saving Service" with the "Revenue-Cutter Service" in 1914, and relates Coast Guard work on enforcement during the Prohibition era, ice-breaking and navigations enhancement, marine safety, delivering food and supplies to researchers on various islands, helping salvage or repair wrecked, impaired, leaking vessels, and weather observation/patrolling.

Also of interest is how USCG officials coped with budgetary problems, funding cuts, threats of being abolished, and the problems attendant in growth, adding new technology (i.e., Coast Guard air stations, etc.), being incorporated into U.S. Navy duty during WWI, and more.

Its reentry into U.S. Navy service again in WWII is also described, along with conversion of fishing trawlers to USCG duty in WWII, use of ocean station cutters, and the Coast Guard's expanding role in regards to recreational boaters and boating—in search, rescue, education, and navigation aids (loran). Also related is the USCG transfer from the Treasury Department to the Department of Transportation, and its expanded duties in coping with oil pollution and other environmental protective measures. Included are a number of truly outstanding ocean rescue operations as well.

Hardbound, the 412-page volume is indexed, presents many notes and citations, and is a well-researched and thoroughly documented treatise, with enough anecdotal tales to make a lively historical account of an important U.S. maritime agency. It is available from the publisher for \$24.95.

A Critical Look at the NMFS

The fourth annual edition of the "Audubon Wildlife Report," published

for the National Audubon Society by Academic Press, Inc., 1250 Sixth Ave., San Diego, Ca 92101-9665, presents an 95-page chapter on its featured Federal agency, the National Marine Fisheries Service, which includes a brief history of the agency origin in 1871 through its evolution to the National Marine Fisheries Service in 1970. In addition, other marine articles in the volume discuss the impact of plastic debris on marine wildlife, and species accounts of the North Atlantic right whale and the west coast's dungeness and king crabs.

The bulk of the chapter on the NMFS, written by A. D. Chandler, a New York consultant who provides analyses of marine-related issues for corporate clients, is a critical look at the recent history of the agency, its management authorities and responsibilities, the MFCMA and other legislative authorities for marine resource management, the marine resources themselves, the agency's organization and administration, a budget overview and more.

The chapter on the right whale presents a basic description of the species *Eubalaena glacialis* and its natural history, discusses its past and present status, and presents recommendations for future protection and research. Another "species account" presents similar natural history information for the Dungeness and king crabs, along with historical data on the fisheries for them, harvest data, and current population trends (cyclic patterns, usually, for the Dungeness crab and depletion of the king crab) and a discussion of crab management and recommendations, including taking another look at the possibility of reevaluating the usefulness of the ban on harvesting female crabs. There is, of course, much more in the publication—discussions of North American waterfowl problems, restoring the Everglades ecosystem, Federal agency wildlife budgets, and other items of broader interest to conservation minded readers.

Two other books published by Academic Press and authored by William F. Royce are "Introduction to the Practice of Fishery Science" and "Fishery Development." Though not written strictly for historical purposes, the author does use historical materials to put

his topics in perspective. "Fishery Development," for example, has a section on the evolution of fishing and its governance which describes ancient practices and laws, stock depletions, and management efforts. Another longer section, "Lessons from the past," discusses various fisheries and their role in development, providing an overview of economic development, a summary of the fisheries, fishing practices, production, and management. That sets the stage for the section on fishery development experiences, with selected case histories and discussions of fish farming and sport fishing, as well as commercial fishing. A final section of the hardbound, 248-page book suggests future strategies to overcome constraints on fishery development.

The 428-page hardbound volume on fishery science likewise has some, but fewer, historical references, being primarily a textbook that is divided into three basic sections: First, a discussion of the profession of fisheries science and what it entails; then an introduction to the traditional sciences that apply to the fish and their environment; and, finally, a discussion of current fishery problems in several primary areas and the ways that scientists are coping with them.

International Fishery Regulation Progress

"Ocean Forum" by Roy I. Jackson and William F. Royce, subtitled "An Interpretative History of the International North Pacific Fisheries Commission," is published and available from Fishing News Books, Ltd., 1 Long Garden Walk, Farnham, Surrey, England. History, here, is not necessarily measured in great lengths of time—the INPFC itself is not yet 40 years old—but the treaty that established it was certainly an historic one, and the work of the commission is very ably documented and interpreted.

Initial chapters review the region's early and prewar (WWII) fisheries and attendant controversies and the events leading to and surrounding the negotiation of the "International Convention for

the High Seas Fisheries of the North Pacific Ocean.” Activities of the Commission are related for the following periods: 1954-58, 1959-65, 1966-77, and 1978-85, providing a look at the objectives of the various parties (Canadian, U.S., and Japanese), the concept of Abstinence as conservation and as international law, salmon fisheries regulation, etc. Other chapters review and discuss INPFC research and statistical programs, appraise the INPFC contributions, and assess the future of North Pacific fisheries. Appendixes A and B include the 1953 and 1979 Conventions (plus the annexes, amendments, and memoranda of understanding) and list the INPFC Commissioners from 1954 to 1985, respectively. Appendix C provides brief biographies of some of the major participants; Appendix D lists the INPFC documentation—such publications as the annual report, Bulletins, and Statistical Yearbooks. Appendix E gives excerpts pertaining to fisheries from the Law of the Sea Convention as adopted on 30 April 1982. The 240-page hardbound volume includes a short index, and is invaluable reading for those interested in the history of a pioneering international fisheries commission that was born and grew during a period of great fisheries expansion, and its science, progress, problems, and politics. As Elmer E. Rasmussen notes in his Foreword to the book, “Three friendly nations, deeply divided during the Second World War, have achieved success in managing ocean fisheries where catastrophe might have been the rule.” The authors have provided an important account of the efforts behind that. The volume is sold by FNB at £20.00.

A History of Advancements in Marine Research

“Study of the Sea,” edited by E. M. Thomasson, is subtitled appropriately “The development of marine research under the auspices of the International Council for the Exploration of the Sea,” or ICES, and for which the editor has served as Librarian. Rather than a his-

tory of the organization, this volume is a unique and most useful compilation of important papers and memoranda from ICES archives which provide a historic look at the major developments relevant to the Council’s work through the years. At that, it is an excellent companion volume to A. E. J. Went’s authoritative history of ICES, “Seventy Years Agrowing.”

Included are seminal works in various fields of marine fisheries research, along with other contributions on the formative years of European marine science, including such topics as hydrographical investigations, plankton studies, work on herring scale studies, eel research, early problems seen in whale fisheries, and more. Each article or chapter is introduced with pertinent comments by the editor which help place them in perspective. The articles also discuss such problems of concern to ICES and its members as overfishing, fish migration, transplantation, pollution, fish populations and fluctuations, etc. Some of the papers are strictly historical, but many provide background on matters of some controversy within ICES itself.

Many of the papers, or excerpts therefrom, are by some of the earliest leaders in European marine fisheries research and in the development of marine fisheries management theory. Also included are later reviews, often by students of the fishery pioneers. In sum, the volume provides an excellent look at the thoughts and studies behind some of the important advancements in marine fisheries. Hardbound and indexed, the 256-page book is available from the publisher at £26.00 or, in the United States, from Bernan-Unipub, Lanham, Md. (price not available).

A History of Fisheries Research in Scotland

“Developments in Fisheries Research in Scotland,” edited by R. S. Bailey and B. B. Parrish, has been published by Fishing News Books, Ltd., Farnham, Surrey, England. It is an excellent review of the development of that nation’s fisheries research, accounts of

the fisheries, assessment and management of the stocks, and much more. Bailey is with the Marine Laboratory in Aberdeen and Parrish is with the International Council for the Exploration of the Sea (ICES) in Copenhagen.

A purely historical chapter leads off, written by Sir Cyril Lucas, a past Director of the Fisheries Research Laboratories of the Department of Agriculture and Fisheries for Scotland at Aberdeen and Pitlochry. Here, he reviews the development of fisheries research in Scotland during the past century, with especial emphasis on its foundations and the work of Scottish scientists with ICES and for other organizations, with their collection and utilization of fishery statistics.

Then follow two chapters on stock assessment—one an account of the Marine Laboratory’s data acquisition system for the Scottish fishery for demersal species, and the other describing acoustic techniques for estimating the quantities of fish in the ocean. Also discussed are problems involved in matching practice to theory in fisheries management.

The next three articles provide reviews of important Scottish fisheries—the Scottish pelagic fisheries for herring and mackerel, industrial and underutilized fishery resources, and Scottish shellfish fisheries.

Other chapters discuss recent research on the Norway lobster, *Nephrops norvegicus*, and the history of research on early life history stages of fishes. Also reviewed is the Laboratory’s applied research on the design and operation of fishing gears in relation to increasing the efficiency of commercial fishing practices. Another article discusses studies of the behavior of fish during fishing operations.

A section on “marine environmental research in relation to fisheries” presents articles on the role of hydrography in influencing biological conditions in the northwestern North Sea; the primary ecological subdivisions of the North Sea and aspects of their plankton communities; pollution effects on marine ecosystems and fisheries; and how environmental research is linked to our understanding of fish stocks. Other sec-

tions deal with the research on freshwater environments and Atlantic salmon stocks and salmon management, while the final section presents articles on the ocean ranching of Atlantic salmon, studies in fish diseases, and the growth of salmon and trout farming in Scotland.

In sum, this is an excellent historical survey of Scottish fisheries with selected case histories which reflect the evolution of fisheries research over a century; it should be of wide interest. The 282-page hardbound volume is available in North America from Bernan-Unipub, Lanham, Md. (price not given), and in the U.K. from the publisher, at £27.50.

Canadian Fisheries Science Developments

"The Aquatic Explorers," by Kenneth Johnstone, subtitled "A History of the Fisheries Research Board of Canada," presents a thorough and detailed look at that nation's fisheries and their research and management—the 75 years of the Fisheries Research Board itself plus material on early fisheries up to the point of Confederation of the Provinces (B.C. joined in 1871). The book is published by the University of Toronto Press in cooperation with the FRBC and other Canadian science and fisheries agencies.

In the beginning, Canada's scientific fisheries "investigators" were volunteers, serving without pay. Chapter 2, prelude to the Board, reviews the political background leading to establishment of the FRBC in 1898—then called the Board of Management of the Marine Biological Station of Canada and directed by E. E. Prince. The author has combed FRBC files, reports, correspondence, and the numerous personal interviews with senior officials conducted by J. C. Stevenson to produce this volume. Included are histories of various biological stations, evolution of the Board of Management to the Biological Board, and short biographies of important early workers. Almost decade by decade the author has related advances and practical biological and technological research, to chart the growth and evolution of the agency and its studies.

Other chapters describe the various

international agreements and commissions with which Canada is involved, establishment of the university marine research labs and stations, and publications and reports of the Board. Appendices list chairmen of the Board, members of the Board and its predecessors, principal establishments of the FRB and directors, and editors and the editorial board overseeing the Board's publications. Along the way, the author outlines the Board's goals during different periods and leadership, problems and progress, etc. Well written and well illustrated, the 342-page hardbound volume is an excellent review of the history of Canada's Fisheries Research Board, its aims and its accomplishments.

Exploring the Indian Ocean

"Deep-Sea Challenge, the John Murray/Mabahiss Expedition to the Indian Ocean, 1933-34," edited by A. L. Rice, has been published by the Unesco Press, 7 Place de Fontenoy, 75700 Paris. The scientific results were published by the British Museum (Natural History) between 1935 and 1967 and form a rather impressive record. And, editor Rice concludes that the John Murray/Mabahiss Expedition was a significant one, pointing out that it had considerable "political" implications in Egypt, and that the importance of the scientific results has become apparent only in retrospect.

First, the editor discusses the John Murray bequest for the expedition and the organization of it. That is followed by the lengthy and interesting narrative of the day-by-day operation of the expedition as prepared by Lt.-Col. R. B. Seymour Sewell the expedition's chief scientists—the lengthiest part and the "meat" of the book.

This, based on Sewell's final bound copy of his narrative, reports that the vessel departed on 3 Sept. 1933 to begin the expedition, and returned nearly 9 months later after working 209 scientific stations and amassing data and preserved materials which were utilized in the lengthy series of scientific reports published over the next 30+ years.

In Part 3 are presented biographical notes on the principal participants, including Sewell, Rice, K. N. MacKenzie (captain), W. I. Farquharson (navigator and second in command), E. F. Thompson (senior chemist), H. Fauzi, A. F. Mohamed, H. C. Gilson, T. T. Macan, and four Egyptian officers. Rice then presents the story of the ship *Mabahiss*, herself, and then he and G. E. R. Deason discuss the significance of the expedition. John Murray, who wrote 1,600 pages of the *Challenger* reports and coauthored a like amount, had set up a bequest 20 years earlier that financed the entire expedition.

Clearly, the volume will provide fascinating reading for those interested in the history of marine research and should even provide some interesting insights for others who also spend time at sea in pursuit of truths. Hardbound, the 336-page volume is available in the United States from Bernan-Unipub, 4611-F Assembly Drive, Lanham, MD 20706-4391 for \$39.00 plus postage.

The U.W. School of Fisheries: A First

"Flagship: A History of Fisheries at the University of Washington" by Robert R. Stickney and currently in press at the Kendall/Hunt Publishing Co., Dubuque, Iowa, 52001, will be the second recent volume in the U.W. School of Fisheries' series "Publications in Fisheries." Publication is expected in about September 1989.

As the first School of Fisheries in the United States, the history of the program at the U.W. is both interesting and instructive, not only for its origins, the leaders of it (and their strengths and weaknesses), but also for its ups and downs—the political and economic pressures brought to bear upon it for good and ill—and as insight into an institution's evolution over several decades. The book is also well illustrated with photographs of the original School and Fisheries Research Institute buildings, past faculty, field stations, the hatchery, laboratories, etc.

The first chapter provides an excellent review of the establishment of the school

and the initial role of the U.S. Bureau of Fisheries (and Commissioner Hugh M. Smith), the American Fisheries Society, Pacific Fisheries Society, and others in stimulating its establishment. The first Director of the College was none other than John N. Cobb, former Bureau of Fisheries employee and editor of *Pacific Fishing*, an extraordinary man with wide fisheries experience but lacking a college degree. Chapter 2 relates the ups and downs of the college after Cobb's passing in 1930—including dissolution of the College of Fisheries and reorganization of the fisheries program, the arrival of W. F. Thompson and a new Department of Fisheries, and a restructuring to emphasize fishery fundamentals rather than courses of practical application. Considerable anecdotes from students and staff provide enlightenment and human interest to the narrative. Also included are interactions with the IFC and IPSFC, initiation of the Fisheries Research Institute, and Alaska salmon research. Chapter 3 details the FRI history, its research studies on salmon, and its branching out into many other fields of marine fisheries research.

Chapter 4 highlights some of the major programs during the period that Lauren Donaldson—known widely for development of the robust “Donaldson trout” strain—was with the UW fisheries program, his selective breeding program, work in radiation ecology, and, of course, his Fisheries Center hatchery on the UW campus to which salmon return each fall.

Chapter 5, on building the academic programs, discusses the School of Fisheries under Wilbert M. Chapman (1947-48) and under Richard Van Cleve from 1948 until 1971 and its many advancements. Chapter 6 reviews “the (Douglas G.) Chapman and (Donald) Bevan Years” from mid 1971 until 1985 when author Stickney took the helm. Appendices list faculty of the College and School of Fisheries from 1959 to 1986 and 1983 School of Fisheries course offerings. Other sections provide extensive chapter notes and an index. The volume provides a thorough look at not only the earliest, but one of the more important U.S. university fisheries programs, its

aims and accomplishments, and the participants involved which should be of interest to fisheries professionals and historians alike. Copies of the paperbound 176-page book will be mailed, as a token of appreciation, to those who contribute \$20.00 or more to the UW School of Fisheries endowment accounts. Publication is scheduled for September 1989; checks should be made payable to “University of Washington.”

The Products of a Marine Science Institute

The Virginia Institute of Marine Science began as a branch of the College of William and Mary in 1940 and was called the Virginia Fisheries Laboratory from 1940 to 1962. Separated completely from the College in 1962, VIMS was reunited with it in 1979. As a scientific institution, VIMS has conducted numerous studies and produced many scientific and technical reports on them, as well as far more numerous informal communications. Those have now been catalogued in “**Products and Productivity of the Men and Women of the Virginia Institute of Marine Science from 1940 to June, 1983, A Comprehensive, Annotated Inventory,**” by William J. Hargis, Jr., and Thomas M. Armitage, as Special Scientific Report 114 of VIMS, Gloucester Point, VA 23062.

The thick, single-spaced 457-page tome indeed catalogs a voluminous record of the institution's marine science progress, listing such items as 1110 “Contributions” to outside publications such as journals, reports, etc., and many types of inhouse publications: SRAM-SOE reports, Special Scientific Reports, Data Reports, Translation Series, and Special Papers in Marine Science. Also listed are grant and contract documents, graduate student dissertations and theses. Another section lists unpublished scientific materials and research and study collections. And a final section lists products of advisory and consultative, extension, and public educational and informational programs—i.e., testimony, essays, resource bulletins, newsletters, tide graphs, and many other educational

or informative materials—all in all, an impressive historic record of scientific documentation.

Also published by VIMS is “**Bibliography of the Monogenea, Literature of the World 1758 to 1982**” by William J. Hargis, Jr., and Dennis A. Thoney, VIMS Special Scientific Report 112, at 384 pages. The volume incorporates 4,883 citations on studies on the monogenetic trematodes which updates a 1969 compilation and four subsequent supplements. It includes several foreign translations and was produced to encourage and facilitate research and to make easier the work of scientists who are studying this particular group of flatworms.

The citations are presented alphabetically by the senior author and include not only taxonomic literature, but references to ecological and physiological studies, and reports of preferred methods of treating their infestations as well. For those interested in this particular group of parasites, the bibliography will be very helpful.

Coordinating State Conservation Efforts

“**Managing American Wildlife,**” subtitled “A History of the International Association of Fish and Wildlife Agencies,” by Dian Olson Belanger, has been published by The University of Massachusetts Press, Amherst, MA 01004. Founded in 1902, the IAFWA has been an effective advocate for professional wildlife management. It is primarily made up of professional conservationists from the state fish and wildlife and natural resource agencies, but also includes members from related Federal agencies as well. The author, a former historian at the Smithsonian Institution's National Museum of American History, has provided a very readable and useful history of the administration of fish and wildlife conservation agencies.

This book is necessarily written from the perspective of the IAFWA's primary members—the state natural resource agencies, and reflects their concerns about various state-federal controversies over resource management. In addition,

it traces the development of the state agencies and their efforts to promote fish and wildlife conservation and management and grapple with the many problems along the way. Issues covered include migratory bird policy, refuges, fish and wildlife propagation, effects of World Wars I and II on conservation, pesticides and other pollutants, outdoor recreation, marine mammals, endangered species, international agreements, and much more.

It covers the period from the inception of many state fish and game agencies and when most of their employees were political appointees, to the development of professionalism in the fields of fisheries and wildlife management. Importantly, the author places all those strides in context with the many other fish and wildlife and environmental steps and controversies which were being debated and made, which gives a valuable insight into this important field.

From its inception, "the International" has promoted rational and professional fish and wildlife management,

public understanding of the need for sound management, collaboration between conservation agencies and organizations with similar goals, and much more. This book is an excellent rendition of their progress and successes.

Also included are extensive notes and literature sources, an index; appendices provide data on major developments in the history of fish and wildlife management, presidents of the IAFWA, dates and places of annual meetings, honorary life members, recipients of the Seth Gordon and Ernest Thompson Seton awards, and a digest of the resource policies of the IAFWA.

The parts on marine resources are a bit light, for the emphasis seems to be on wildlife. The section of the MMPA is likewise very brief. However, the book is an important resource in the history of natural resource management, particularly from the point of view of state fish and wildlife agencies. The 247-page volume is available from the publisher in both paperback (\$11.95) and hardback (\$25.00) editions.

National Wildlife Federation History

Fish and wildlife conservation seems to have had several "bursts" of creativity of stimulation, and the early to middle 1930's was one of them. One of the conservation groups spawned then was the National Wildlife Federation, the official history of which is "**Guardian of the Wild**" by Thomas B. Allen, subtitled "The Story of the National Wildlife Federation, 1936-1986." and published in association with the NWF by the Indiana University Press, Bloomington. During the last 50 years, the Federation has been important in marshaling public support for much of the key national fisheries and wildlife legislation and environmental protection programs.

The NWF began life with the first North American Wildlife Conference in February 1936, and was named the General Wildlife Federation, with Jay N. "Ding" Darling as its first president. It was renamed the National Wildlife Federation in 1938. Darling, long-time con-

servationist, editorial cartoonist, and one-time chief of the U.S. Biological Survey, knew both conservation and politics, telling the 1937 Federation meeting, "Fisheries and Biological Survey are the two (Federal) bureaus which are first cut when an economy wave sweeps through the government, and the last to be restored when prosperity returns. That also is a job for the Federation." Clean water has also been on the top of their list, with Darling reminding the Federation, also in 1937, of the Connecticut River's pollution problems, noting "A million-dollar industry in salmon went up and down the Connecticut River, and now a crayfish can't live in it."

Another very early educational program, "National Wildlife Restoration Week," evolved into the well known "National Wildlife Week" which promotes a different conservation theme each year. Yet another was the popular series of wildlife stamps.

Over the years the NWF has evolved into one of the largest and more effec-

tive private conservation organizations and this well-written book documents its progress, programs, and efforts to restore and protect all of America's natural resources. Indeed, it has branched into a very broad range of environmental concerns. Notwithstanding the "wildlife" in its name, the NWF has been deeply involved in many conservation issues related to marine mammals and fishes, and, certainly, the issue of clean water has been a mainstay in its activities. It also conducts educational programs and produces a wide variety of publications, including the annual "Conservation Directory".

Appendixes list affiliate organizations of the NWF, all the national wildlife week themes and chairpersons, the original wildlife week proclamation, NWF presidents, past winners of the NWF National Conservation Achievement Awards, the NWF Creed, the NWF purposes, important laws that the NWF has helped secure in the last 50 years, (including several related to coastal and marine resources and water pollution control), and important legal cases litigated by the NWF lawyers. Indexed, the 212-page book provides an interesting history of an important private conservation organization and its interactions with Federal agencies, and its work in conserving America's natural resources.

IGFA Celebrates Its 50th Anniversary

Yet another conservation-minded organization is soon (1989) to celebrate its 50th Anniversary—the International Game Fish Association of 3000 East Las Olas Blvd., Ft. Lauderdale, FL 33316-1616. And, in its official annual publication, "**1989 World Record Game Fishes**," published under the direction of president Elwood K. Harry, reviews its accomplishments in an article "50 Years of Record-Keeping." Until 1939 there was no uniform, accepted set of angling ethics or standards of conduct and no organization to compile records of large fishes on a worldwide basis. This latest publication also contains now a total of 3,113 world fishing records, including 355 in the all-tackle category, for both freshwater and saltwater spe-

cies. In addition to its work in compiling angling records and promoting fishery conservation, IGFA has also compiled an extensive collection of angling literature artifacts of considerable historical interest.

The IGFA was begun on 7 June 1939 at a meeting held at the American Museum of Natural History and attended by prominent anglers, outdoor writers, and fisheries scientists. Among its first tasks were the establishment of basic angling standards and begin its recognized saltwater angling records activities, and promotion of sportsmanship.

Initially the keeper of saltwater angling records, the organization accepted the freshwater angling records and record-keeping responsibilities in 1978 that the magazine *Field & Stream* had compiled, along with attendant historical data. Later that year, IGFA accepted responsibility for records for saltwater fly fishing and spin fishing, all of which necessitated new or revised rules, etc. And today, IGFA keep records for 157 species in all line classes for both freshwater and saltwater species. In addition, the organization serves as a liaison between the recreational fishing and scientific communities and promotes the tagging of fishes and other conservation and management activities.

As usual, the 320-page paperbound 1989 volume presents the many world records granted by IGFA as of 1 January 1989, along with the international angling rules, world record requirements, etc. Other articles of interest discuss the huge catfishes of the Amazon River, Europe's large pikes, world-wide fishing opportunities, the largemouth bass, angling ethics and sportsmanship, and current conservation problems: The greenhouse effect and marine pollution. The book costs \$11.75 (domestic) and \$12.75 (foreign), postpaid.

The Environment As History

The Sierra Club is one of the nation's oldest environmental groups, organized in the latter part of the 19th Century as something of a localized "outings" club, oriented mostly toward park and Sierra wilderness preservation, but which has

grown to become an effective environmental organization. Comes now "**The History of the Sierra Club 1892-1970**" by Michael P. Cohen, published by Sierra Club Books, 730 Polk Street, San Francisco, CA 94109.

Of course the organization's concerns have expanded and now encompass most important environmental issues, including those affecting marine ecosystems and animals. The book is an excellent narrative account of the Sierra Club itself and those persons who have molded and led it. It also gives readers a good insight into the environmental movement and the role of the Sierra Club in it, which will be both educational and interesting to both friend and foe of the Club. Indeed, a case could be made that the Sierra Club was one of the main players in forming what is often called the "environmental movement." This is, of course, a mostly friendly chronicle of the Club and its accomplishments, but it is nonetheless accurate and informative. If one is to consider the history of the American conservation movement, they must consider the private organizations as well as the public agencies involved, and this volume is a good start in that direction.

The author, who has also written a prize winning biography of Club founder John Muir, covers the Club's history in several phases, beginning with the period 1892 to the death of Muir (its president) in 1914 when the Club was devoted to advancing Yosemite National Park and the wilderness of the Sierra Nevada.

A second period, 1915-34, saw Club interest grow to the entire National Park System and park expansion in California. Through the 1940's Club leadership redirected policies more toward a developing ecological thought on the value of wilderness. Many of those developing ecological philosophies, then, evolved toward the environmental movement of the 1950's, '60's and '70's. Indeed, the Club has had a large impact on modern popular environmental/ecological thought and, through its legal and political efforts, it has had considerable effect on private and governmental policies and actions.

The author has provided a good in-

side look at the originators, the leaders, and some of the infighting, etc. of an influential organization whose environmental concerns grew to include eventually such marine topics as marine mammals, oil pollution, estuarine preservation and much more.

The 576-page hardbound volume is sold by many bookstores or can be ordered by direct mail from Sierra Club Store Orders, 730 Polk Street, San Francisco, CA 94109 at \$29.95 each plus \$4.50 postage and handling.

Who Started and Led American Conservation?

"**National Leaders of American Conservation,**" edited by Richard H. Stroud and published by the Smithsonian Institution Press, 470 L'Enfant Plaza, Suite 7100, Washington, DC 20560, augments and revises the earlier 1971 volume edited by Henry Clepper. It was sponsored by the Natural Resources Council of America, a private group of 52 environment-conservation organizations.

The book presents short (1-1½ pages) biographical sketches of persons who have been the movers and shakers of American conservation. An important criterion for inclusion, however, is that the person and achievements be of national importance. Those important only locally or regionally are excluded. Nominations for inclusion were made by NRCA member groups and selected by an editorial committee. In reading through the book, one is struck by, what editor Stroud refers to as, that "the 'face' of conservation is undergoing significant change. It will be evident that an older generation of leaders—in majority, pragmatic resource specialists—is in the process of transferring the reins of the conservation team to a younger generation of leaders—some of whom are idealistic generalists." That is also evident from the makeup of the NRCA itself; the three "fisheries" groups listed, the American Fisheries Society, the Sport Fishing Institute, and Trout Unlimited, are greatly outnumbered by many newer environmental groups.

It is good that the book is available, for the careers and accomplishments of

many conservationists are often overlooked years after they pass from the scene. It begins with a short introduction to the origins of the American conservation movement and its leaders, and then presents the biographical sketches, arranged alphabetically, ranging from Ansel Adams, photographer, to Raphael Zon, forester. Presumably each person who reads the book will believe that his or her speciality is underrepresented. Still, it appears that fisheries science, in particular, marine fisheries, should have had a few more of its leaders represented. The book includes such leaders as Spencer F. Baird, Reeve M. Bailey, David L. Belding, Frank E. Carlton, Rachel L. Carson, R. W. Eschmeyer, Barton W. Evermann, Seth Gordon, William G. Gordon, John S. Gottschalk, John P. Harville, Ralph O. Hile, Carl L. Hubbs, Robert F. Hutton, David Starr Jordan, Robert J. Kemp, Karl F. Lagler, William M. Lawrence, Aldo Leopold, Daniel Merriman, James W. Moffett, Paul C. Prichard, A. C. Redfield, William E. Ricker, Elwood A. Seaman, S. F. Snieszko, R. H. Stroud, Carl R. Sullivan, A. V. Tunison, John Van Oosten, Lionel A. Walford, David H. Wallace, and Christopher M. Weld.

Others listed having a fisheries background include Irwin Mark Alperin, Arthur R. Benson, Edward A. Birge, C. J. D. Brown, Kenneth D. Carlander, Herbert S. Davis, Samuel Eddy, George J. Eicher, Emmaline Moore, George C. Embody, Albert S. Hazzard, Robert M. Jenkins, R. E. Putz, Gilbert C. Radonski, and a few others; in all, over 480 conservationists are listed—active, retired, and deceased. Absent are quite a few who have made considerable contribution to the advancement of marine fisheries and marine fisheries science, not to mention oceanography. Nevertheless, the book is an important conservation history resource, and it provides interesting reading and insight into the background of some well known and some almost forgotten conservation leaders, as well as authoritative documentation of their backgrounds, affiliations, and most important contributions. Included are sources of other bibliographic materials for those inclined to read further. Indexed by biographee and

individual contributor, the paperbound 432-page volume is available from the publisher for \$25.95.

John DeWitt Gilbert: Toward a History of Fisheries Regulation

Sometimes America's conservation leaders have come from fields outside of professional fisheries ranks, and that was certainly the case with John DeWitt Gilbert. Schooled in journalism and a city editor with the *Astoria* (Oreg.) *Budget*, he became associate editor of *Pacific Fisherman* in 1928, a move that ushered in a long and productive career in the fisheries field. Fortunately, he left a manuscript, produced over quite some time, which has now been published as "**Fish for Tomorrow**" by the School of Fisheries, WH-10, University of Washington, Seattle, WA 98195, which chronicles many of the national and international advancements in marine fisheries and their management that he witnessed or participated in during his long career.

The magazine he joined, one of the leading private U.S. commercial fishery journals, had been founded in 1902 by Miller Freeman. Later, in 1943, Gilbert returned to *Pacific Fisherman* as editor (after about a 4-year stint as editor of Freeman's new magazine *Mining World*), a post he held until retiring in 1966. (*Pacific Fisherman* merged with *National Fisherman* in 1967—a year later.) Besides providing editorial leadership, Gilbert served as a member of such groups as the Industry Advisory Committee of the International North Pacific Fisheries Commission and the Pacific Salmon Fisheries Commission. His manuscript was drafted partly with the collaboration of Freeman, and it provides a wealth of information and insight into the negotiation and operation of a variety of important international fisheries treaties, commissions, agencies, etc., pointing out the pitfalls, errors, and successes, often from the viewpoint of an active participant.

Chapter 1, "Events and actions leading to the first treaties and commissions," reviews the plight of the Fraser River sockeye salmon during the early 1900's, the First International Sockeye

Commission (and some of its problems, failures, progress and successes), and the Second International Sockeye Commission. Other treaties reviewed and discussed include the early Pacific halibut treaties, the sockeye salmon treaties of the 1930's, the U.S.-Mexican tuna treaty, and certain interstate commissions and treaties: The Atlantic States Marine Fisheries Commission, Pacific Marine Fisheries Commission, the Oregon-Washington controversy over Columbia River fisheries in the early 1900's, and expansion of Federal authority in the 1940's and the Pacific states' response. Chapter 6 reviews the origins of abstention, Japan and its high-seas processing and refrigeration, and the early tuna fisheries. And chapter 7 reviews various post-war treaties and commissions: The Pacific Fisheries Conference, IATTC, Northwest Atlantic Treaty, INPFC and the Japan Fisheries Treaty, etc. Also of interest are Gilbert's words on the people involved—the key "movers and makers" and the politics behind the treaties in the last two chapters. The volume ends with the middle 1950's, just after several important international fishery treaties had been adopted, and is an interesting chronicle of the struggle to get such treaties and laws based on scientific conservation principles.

Indexed (but without a bibliography), the manuscript of the 162-page paperbound volume was made available to the U.W. School of Fisheries by the Gilbert family. Copies will be mailed, as a token of appreciation, to those who contribute \$20 or more to the School of Fisheries endowment accounts (make checks payable to the University of Washington). Contribution donations are placed in the School of Fisheries endowment accounts to provide scholarships and other support to students.

The Evolution of a Conservation Ethic

In the annals of American conservation, two names crop up again and again, not always as scientists, but as ones whose writing have been most influential. The names, of course, are

Rachel Carson and Aldo Leopold—perhaps because they very effectively enunciated what has become to be known as a “conservation ethic.” Though a forester by training, Leopold became known first, as a leader in the fledgling issues of wildlife management, and later for such popular conservation writings as “A Sand County Almanac,” and others.

Last year, 1987, was the centennial observance of Leopold’s birth and recent months have seen three new books commemorating his life and work; several others are forthcoming. First is “**Aldo Leopold: Mentor**” mostly written by Leopold’s graduate students, published as the proceedings of an Aldo Leopold Centennial Symposium by the Department of Wildlife Ecology, 226 Russell Labs, University of Wisconsin, Madison, WI 53706, and edited by Richard E. McCabe. Essentially, it is a festschrift—a collection of tributes to a truly great conservation leader. Unlike some Leopold books or articles, the contributions are by those who knew him best as friend, professor, colleague, and family.

Thus many of the contributions are personal and almost private reflections on Leopold, and they provide a rare and insight into Leopold’s thoughts, advice and counsel, etc. For those interested in the man behind the conservation ethic, this is a most interesting volume. Included are 20 contributions—memoirs of a sort—that sometimes tell as much about the authors as about Leopold, and it also provides a unique insight into the type of person who chooses to become a professional conservationist. The 126-page paperbound volume costs \$7.50.

Also published by the Department is a longer tribute by Robert A. McCabe entitled simply “**Aldo Leopold, the Professor,**” as most of his students seem to have called him. McCabe’s much longer contribution to the festschrift was separated from the others and published separately at \$29.95 (hardcover), with profits going to the University of Wisconsin-Madison’s Department of Wildlife Ecology.

Here McCabe, who worked closely with Leopold, reveals the man and his philosophy as he knew him, recording Leopold’s beginnings as a university

professor, his relationship with academia the students, and he records many of the events during Leopold’s most productive years. Included are about 50 personal photographs of Leopold’s.

A third volume from a second Aldo Leopold Centennial Celebration—this time at Iowa State University—is **Aldo Leopold, the Man and His Legacy,**” edited by Thomas Tanner and published by the Soil Conservation Society of America, 7515 Northeast Ankeny Road, Ankeny, Iowa 50021. This one is much different, but, like the others, essential reading on Leopold. Here is a collection of essays, some from the centennial, some added, by various scholars and family members, again shedding much light on Leopold’s life, values, and philosophy.

The book is presented in three parts with the first devoted to studies by Leopold biographers and scholars who document the evolution of the man’s environmental philosophy and its place in the history of American thought. The contributors, professional historians, political scientists, etc., provide a unique insight into the effects of Leopold’s thought and writings on the American scene.

The second section provides more of a look at Leopold’s influence on natural resource professionals. And the third section “From Burlington to Baraboo,” presents various recollections of Aldo Leopold by various family members—again adding additional parts to the puzzle of Leopold’s life and the influences that helped make him what he was—one of the most influential conservationists of our era. The book, paperbound and 175-pages long, is sold by the SCSA for \$10. In sum, the contributions here are a bit more scholarly, and at least in part, are an effort to put the philosophy of a grassroots conservation professional into overall perspective.

A Biography of an Oceanographer

“**The Crest of the Wave, Adventures in Oceanography**” by Willard Bascom, published by Harper & Row, Publishers, Inc., 10 East 53rd Street, New York, NY 10022, is an entertaining and inter-

esting memoir of the author’s 40 years work in a rapidly expanding field. Bascom, who started his career in 1945, participated in a wide variety of important oceanographic advancements.

Besides the personal memoir, it serves also as a review of several major strides in oceanography over the years with which the author was involved. It begins with the author’s introduction to oceanography in 1945 by John Isaacs who recruited him for a wave study contract for the U.S. Navy. Indeed, he ranges from the use of aerial photography to aid coastal research to the use of modern satellite technology in oceanographic research, all of which is enlivened by many anecdotes on such things as a proposal to pipe Columbia River water from the mouth down to southern California, the existence of a “green flash” just at sundown, his early use of scuba gear, and his trek through the South Seas. The author also conducted wave studies in connection with Pacific nuclear tests, deep-ocean drilling experiments, helped retrieve diamonds and rocket nose cones from the ocean floor, searched for sunken Spanish treasure, etc.

In a later chapter, “Ocean Pollution?,” Bascom takes a look at the fine line that seems to separate the step from “enrichment” to “pollution,” and his distaste for politicians and environmentalists who seem to ignore scientific fact in favor of hype and emotionalism. His final chapter looks forward to wind-powered vessels, satellites and oceanography, and other possible advancements.

The book is written for a general audience and to stimulate younger readers to enter an oceanographic profession. Hardbound, the 318-page volume provides interesting reading and costs \$19.45.

Of Whales and Their Early Exploitation

Publication of “**On the Northwest: Commercial Whaling in the Pacific Northwest, 1790-1967,**” by Robert Lloyd Webb, has been published by the University of British Columbia Press, #303 — 6344 Memorial Road, Vancouver,

B.C., Canada V6T 1W5. Webb is Curator of Research at the Kendall Whaling Museum, Sharon, Mass., and he has combed extensive archives, logs, correspondence, files, literature, etc., to present the first lengthy and detailed look at the history of whaling in this region until it died out in coastal Canada in the late 1960's.

The author begins with a look at aboriginal whalers and whaling, their contacts with early explorers, and the development of interest in whaling in the region by U.S., British, and other commercial whalers. In addition, he discusses politics and personalities involved, the companies and the vessels, and the crews.

Whaling effort on the Northwest Coast in the 1840's was very intense, though many vessels later headed northward for the bowhead whale, as Northwest whaling sputtered. But Northwest whaling did not stop; indeed, it continued to be prosecuted. While it may not have competed economically with that of the South Seas sperm whale fishery or Antarctic whaling, the region's whale fishery had considerable regional and cultural significance and an impact on the development of commerce in the Pacific Northwest. Shore whaling stations and the effects of the entry of steam vessels and large-bore cannons are also related, as the author describes how the whaling industry drove its prey to commercial extinction.

Also discussed are various treaties or whaling conventions and their effects on the region's whaling activities. Included in Appendices are the journal of the whaler *Caroline* on the Northwest coast during September 1843 and a thorough description of the Rose Harbour Whaling Station in 1928 on Kunghit Island in B.C.'s Queen Charlotte Islands. Copious notes and references are provided. The volume is well written, authoritative, and well illustrated with many paintings, prints, photographs, and drawings, and is an excellent history of whaling from about Gray's Harbor, Wash., northward to the Aleutian Islands. The 449-page hardbound volume is indexed and costs \$29.95 (Can.) or \$25.00 (U.S.).

IWC Whaling Histories

Another volume of historic interest is "**Right Whales: Past and Present Status**," published as Special Issue 10 of the International Whaling Commission, The Red House, Station Road, Histon, Cambridge CB4 4NP, England, and edited by R. L. Brownell, Jr., P. B. Best, and J. H. Prescott. This book constitutes the proceedings of a workshop on the status of right whales held in 1983, and includes many interesting and authoritative studies on the historic exploitation and current status of these species worldwide. Articles are presented on the history of right whale catches in Japanese waters, in the eastern North Pacific (south of 50°N and east of 180°W), archaeological evidence of the 16th century Basque right whale fishery in Labrador, a review of old Basque whaling and its effect on the right whales of the North Atlantic, the Long Island, N.Y., right whale fishery between 1650 and 1924, and American pelagic whaling for right whales in the North Atlantic.

For the southern hemisphere, articles discuss nineteenth century right whale catches of the southern coasts of western Australia, right whales caught off southeastern Australia and New Zealand, a catch history of French right whaling in the south Atlantic, and shore-based right whale catches off southern Africa between 1792 and 1975. In addition, Howard Braham provided an annotated bibliography of right whales in the North Pacific, discussing some 108 items with data on sightings, distribution, abundance, migration, historical catches, life history data, and prey items.

Other papers discuss more recent 20th century research on the records of sightings, distribution, and status of the right whales in areas of both the southern and northern hemispheres. The 289-page volume is hardbound, and each paper includes extensive references. It should be an excellent source of data on the right whales. Cost is US\$55.00 plus US\$8.00 postage.

Special Issue 7 of the IWC is "**Bibliography of Whale Killing Tech-**

niques" by E. D. Mitchell, R. R. Reeves, and A. Evely, who are affiliated with Canada's Arctic Biological Station. The listings are extensively annotated, and the many illustrations, along with the introduction, make the book almost an encyclopedia of the harvest methods. Appendices review aspects of pre-World War II German electrical whaling methods and the IWC reviews of the humane killing of whales, 1982-86.

Whales have been hunted for many hundreds of years by virtually all maritime cultures in contact with them and this volume presents a good and succinct review of the literature on the techniques used and the gears employed. The introduction provides a brief overview of the history of whaling and the development of the harvest methods from the earliest to recent times. All in all, it is a good source of historical information on matters relating to whale hunting, and the efforts at coming to grips with humane whale harvest techniques. Cost is US\$20.00 plus US\$8.00 postage (If two or more IWC volumes are ordered, postage for the second and subsequent volumes in only US\$6.00 each).

Special Issue 8 of the IWC Reports series is "**Behavior of Whales in Relation to Management**," edited by G. P. Donovan, which incorporates the proceedings of the workshop of the same title held in Seattle, Wash., in April 1982, and chaired by Michael Tillman.

The volume leads off with a lengthy report of the workshop edited by Tillman and Donovan in which they review and discuss various behavioral "problem areas" relevant to whale management, including aspects of the social behavior of whales, their site fidelity (areas for mating, calving, feeding, migratory routes, and changes therein), periodicity in breeding cycle, reactions to vessels, respiration patterns, vocalization patterns, etc., and they suggest possible management actions and proposals for further research.

The individual papers are divided into general subject categories, with the first four papers reviewing aspects of cetacean behavior in light of behavioral thought on other species of mammals.

The next four papers discuss various methodological approaches to studying whale behavior, and five additional papers specifically address gray and bowhead whale studies, including their migratory, social, and breeding and social behavior. The final paper discusses the estimation of the size of naturally marked whale populations using capture-recapture techniques. The 282-page volume is hardbound, but not indexed; each paper carries its own references. Cost is US\$35.00.

Special Issue 9 in the same series, edited by R. L. Brownell, Jr., and G. P. Donovan, is "**Biology of the Genus Cephalorhynchus**," and it includes 17 contributions on the four recognized species of this widely distributed coastal delphinid of the Southern Hemisphere. The four species are: Commerson's dolphin, *C. commersonii*; Chilean dolphin, *C. eutropia*; Heaviside's dolphin, *C. heavisidii*; and Hector's dolphin, *C. hectori*. All are Southern Hemisphere species and have been poorly known and little studied, at least in part owing to their remoteness. This book, however, which updates papers given on the genus at a 1984 IWC subcommittee meeting on small cetaceans and includes other new contributions, sheds considerably more light on them.

In Section I are presented 10 papers on the abundance, biology, exploitation, distribution, and status of the Commerson's dolphin, the species with the greatest north-south range. Included is brief information on early human contact with the species and its harvest. Section 2 presents two papers on the Chilean dolphin and a single paper in Section 3 on Heaviside's dolphin corrects previous

descriptions of that species, which is believed to be confined to the west coast nearshore waters of southern Africa.

An additional four papers discuss aspects of Hector's dolphin which is endemic to New Zealand waters. Again, little is known about the species, though the papers in this volume seem to indicate that it is more widely distributed and more numerous than was previously thought, although also reporting that large numbers of them are killed in gillnets.

The 344-page volume is hardbound; each paper carries its own references; there is no index. Cost in the United Kingdom is £20.00 plus £4 postage; in the United States is \$35.00 plus \$8.00 postage; and elsewhere is £20.00 plus £5.00 postage. The genus itself represents a number of interesting characteristics—females are larger than males, genital coloration is sexually dimorphic; anterior edges of flippers may have peculiar serrations along the anterior edges, etc. While popular interest in such species is limited, the book is a commendable effort at presenting current knowledge about them and may perhaps generate more interest in their study and management.

Histories of the Catch of Belugas or White Whales

Modern concerns about the status of certain marine mammals raise the question of how modern today's populations of today compare with those of historic or precommercial levels. Two recent Canadian publications explore this question for the beluga whale: "**History**

of White Whale (*Delphinapterus leucas*) Exploitation in Eastern Hudson Bay and James Bay" by Randall R. Reeves and Edward Mitchell and "**Distribution and Migration, Exploitation, and Former Abundance of White Whales (*Delphinapterus leucas*) in Baffin Bay and Adjacent Waters**", also by Reeves and Mitchell; respectively, they are Canadian Special Publication of Fisheries and Aquatic Sciences 95 and 99.

By doing extensive study of both published and unpublished documents, the authors have presented useful reviews of the history of the exploitation of these mammals and the relative status of their stocks. Reported are current distributions for the regions studied and suggestions are made for additional research to determine movements of individuals and stock relationships and to help resolve questions on turnover rate, homing, and population size, and whether the Greenland harvest impinges on the Baffin Bay area whales. They also suggest historical studies in Scottish libraries, archives, and other collections to discover the impact of Scottish whaling on the species in the latter 1800's. Also discussed are stock identity, whaling sites, catches, and more.

Though the white whales still inhabit parts of Hudson Bay and James Bay, they are much diminished, the authors report, and they suggest protection of the estuaries presently and formerly used by the species. Publication No. 95 is 45 pages, paperbound; no. 99 is 34 pages, paperbound, and they are sold by Supply and Services Canada, Ottawa, Ont. K1A 0S9, at \$5 in Canada and \$6 elsewhere.

MBL at Woods Hole Marks Centennial

To mark the centennial of the Marine Biological Laboratory in Woods Hole, Mass., two publications have recently been published. First is "**100 Years Exploring Life, 1888-1988**," subtitled "The Marine Biological Laboratory at Woods Hole" and written by Jane Maienschein, an associate professor of philosophy at Arizona State University

who specializes in history and philosophy of science. It was published by Jones and Bartlett Publishers, 20 Park Plaza, Boston, MA 02116. Second is the reprint, as a Supplement to *The Biological Bulletin*, 174(1), of Frank R. Lillie's 1944 volume "**The Woods Hole Marine Biological Laboratory**" which was originally published by the University of Chicago Press. (An earlier Symposium Supplement to *The Biological Bulletin*, 168(3), published in June 1985

and devoted to articles on "The Naples Zoological Station and the Marine Biological Laboratory: One Hundred Years of Biology" also provides important historical material on the institution and its work.)

Maienschein's volume is not only an authoritative account of the history and progress of the MBL, but an interesting look at the personalities behind it and their interactions and activities. Lively and well written, often through the

words of the scientists themselves, it is a more personalized look at the evolution of an important U.S. biological laboratory. Along with the archival material, the author weaves in the human side of early MBL life—the old mess hall, the MBL Club, outings and picnics, marriages, drama, music, canoe races, and other diversions. In addition, the text is complemented by many excellent historic photographs selected by Ruth Davis.

Chapters relate the initiation of the MBL in Woods Hole and its nearby forerunners, life at the MBL, the buildings, and funding; a full chapter is devoted to the MBL's fine library and publications. Additional chapters discuss the students and administrators and other MBL personalities.

While the MBL has been on the cutting edge of basic biological studies, it has also been famous for its summer teaching and research programs. Discussed are the early days of marine biology, early techniques and equipment, organisms and their collection, etc. A final chapter describes sources of information and illustrations; MBL Directors are listed, as are Nobel laureates affiliated with the MBL and their contributions. Notes and specific sources are listed at the end of each chapter. Unindexed, the volume is more of a personal portrait of an important research institution that is well written and illustrated and should be of interest to marine scientists and historians. Hardbound, the 192-page volume is sold by the publisher for \$22.50.

Frank R. Lillie was MBL director from 1909 to 1925, and in 1944 the University of Chicago Press published his in-depth history "The Woods Hole Marine Biological Laboratory." Long out of print, it was republished for the MBL centennial as a special supplement to *The Biological Bulletin* in paperback form (but large format), and it makes an excellent companion to Maienschein's volume. Three chapters were authored or coauthored by E. G. Conklin of Princeton University, including chapter I, "The geography and early history of Woods Hole," which ends with the destruction of the Pacific Guano Works in about 1880. Chapter II reviews the

origins of marine laboratories in Europe and America, and notes the founding of the world's first marine biological station at Concarneau, France, in 1859; a French aquarium in Arcachon for marine research in the 1860's; the Zoological Station of Naples (1872); Louis Agassiz's Penikese seaside laboratory (1873); the U.S. Fish Commission's Woods Hole Laboratory (1885); and Alpheus Hyatt's Annisquam Laboratory (1881), which Lillie noted as "the true precursor of the Marine Biological Laboratory."

Chapter III then describes the founding and early history of the MBL itself, recounting the early struggles (1886-97), under the first director, Charles Otis Whitman, and plans and operations from 1898-1902. The MBL had an uneasy start: The first two potential leaders declined the directorship. Chapters IV and V relate the growth in land, buildings, and budget, and policies, organization, and administration (i.e., trustees, courses, library, publications, etc.). Research progress up to 1908 is traced in chapter VI. (A complete list of publications—860 titles—is in the eleventh annual report of the MBL, 1907-08.)

Sketches of important MBL leaders are presented in chapter VII for Whitman; Charles R. Crane, the lab's principal benefactor; Gilman A. Drew, an MBL officer and assistant director; and Edward Gardiner Gardiner, an original incorporator and trustee. Chapter VIII relates community life and interactions between MBL scientists, while chapter IX views the "spinoff" of the Woods Hole Oceanographic Institution and its early work. Appendixes reprint pertinent correspondence, announcements, articles of incorporation, trustees' reports, by-laws, balance sheets, John Greenleaf Whittier's "The Prayer of Agassiz," and more; references are provided with each chapter. Indexed, the 284-page paperbound volume costs \$10.00.

Also of historical interest is the June 1985 Symposium Supplement to *The Biological Bulletin* which carries the written versions of oral presentations at Ischia, Italy, in October 1984 on the events, ideas, and leaders at both the

MBL and the Stazione Zoologica of Naples since 1872. Papers trace the development of Anton Dohrn's personality and science, the origin of the MBL, and the "new" embryology at the Zoological Station and the MBL. Another interesting piece compares, at 10-year intervals, the official support of the sciences, including fisheries and agriculture, for the United States, the United Kingdom, and Germany from 1850 to 1900. Other papers review the evolution of various disciplines important at the two laboratories, while shorter communications discuss policy and political matters that impinge on their biological work.

A History of Fisheries of the United Kingdom

"Loaves and Fishes," subtitled "An Illustrated History of the Ministry of Agriculture, Fisheries and Food 1889-1989" and written by Susan Foreman, has been published by HMSO, Publications Centre, P.O. Box 276, London, SW8 5DT, U.K., in honor of the MAFF centennial. This is a well illustrated and well written account of food production in the United Kingdom during the past century, the role of the nation's fisheries in it, and the MAFF's research and management.

The book is presented in three parts, with Part I reviewing the initiation and service of the MAFF forerunner, the Board of Agriculture, from 1889 to 1914. In 1903, that became the Board of Agriculture and Fisheries, as it gained new powers and duties relating to the fishing industry. Most of the fisheries work then involved fisheries research, particularly as directed by the ICES. Additional chapters discuss the role and progress of fisheries along with agriculture, forestry, and food during World War I, the period between the wars, World War II, and the post-war period.

Chapters in Part II discuss more specifically animals and the land, fruits and vegetables, and people involved with agriculture and food. The chapter on "statistics and journals" includes information on fisheries statistics collection and other fisheries reports and leaflets.

And the chapter on "Education and research establishments" discusses the Directorate of Fisheries Research, the Torry Research Station in Aberdeen, and food science laboratories. Finally, Part III relates the role of "MAFF Since 1970" in food science and production, pollution prevention, research and development, and includes a special section on its fisheries work. Appendices list Ministers and permanent secretaries, references and a chronological list of important events from 1793 through 1988. Indexed, the 150-page paperbound volume presents an excellent, concise history of U.K. fisheries in relation to other food products and is available from HMSO for £8.00 sterling per copy.

British Marine Journal, Society Note Centennial

During 1987, the Marine Biological Association of the United Kingdom celebrated the centenary of its *Journal of the Marine Biological Association* which first appeared in August of 1887 while its Laboratory was being built. The Association itself had been established on 30 March 1884 during a meeting at the Royal Society in London. An article documenting and commemorating the centenary entitled "The Marine Biological Association 1884-1984: One Hundred Years of Marine Research" was written by A. J. Southward and E. K. Roberts (Rep. Trans. Devon. Assoc. Adv. Sci. 116:155-199) and reprinted as Occasional Publication No. 3 by The Laboratory (of the MBA), Citadel Hill, Plymouth, U.K. That article was later republished with some additions and emendations in the Association's journal in 1987 (J. Mar. Biol. Assoc. U.K. 67:465-506), along with a short editorial on the journal's centenary. The article is a well written, concise history of the association which details the organization's leaders, aims, policies, research, and accomplishments, and which sheds considerable light on British fisheries and marine studies along with the MAFF's new volume "Loaves and Fishes."

Canadian Research in the Georges Bank Area

"A History of Canadian Fisheries Research in the Georges Bank Area of the Northwestern Atlantic" by R. G. Halliday, F. D. McCracken, A. W. H. Needler, and R. W. Trites has been published by the Marine Fish Division of the Bedford Institute of Oceanography, Department of Fisheries and Oceans, Dartmouth, Nova Scotia B2Y 4A2 Canada as Canadian Technical Report of Fisheries and Aquatic Sciences No. 1550. Originally produced as a background paper for the International Court of Justice case regarding the maritime boundary issue in the Gulf of Maine area, it documents the nature and extent of Canadian fisheries research on Georges Bank up to 1980, listing research cruises, commercial vessels trips on which biological observers were aboard, physical oceanographic observations made by Canadian vessels, and research reports which carried the results of Canadian work relating to the region's fisheries resources. Included is material on the fisheries for the research on such species as scallops, groundfishes, small and large pelagic fishes, lobster, red crab, squid, as well as oceanographic studies, foreign fishing, and related work. Included is a short selected bibliography and an appended listing of research reports related to NAFO Subarea 5 and 6 published by Canadian research workers. Material is presented by species group, and includes data on fishery origins, development or progress of research studies, management information, the importance of the fisheries, foreign fishing and its impacts, etc. The 37-page paperbound report is available from the Institute.

In addition, the Institute published in 1987 the 25th Anniversary Issue of its "BIO Review '86", edited by Brenda Newman and Michael P. Latremouille which reviews briefly the history of the Institute, founded in 1962, and its advancements. The BIO is somewhat unique in its range of endeavor, and the reviews in that issue touch on advancements in physical, chemical, and biological oceanography; fishery biology

and ornithology, marine geology and meteorology, hydrography, cartography, etc. Some specific topics include an historical perspective on marine fisheries management, history of ocean mooring work at BIO, marine oil contamination, photosynthetic picoplankton, physiological energetics of fish, history of BIO navigation research and development, tidal fronts and tidal mixing, ocean climate, and more. Also included are yearly excerpts (highlights) from the BIO Log during 1962-87. The "BIO Review" series was superseded by "Science Review 1987" which, besides chronicling annual progress, includes "A history of chemical oceanographic research in the Gulf of St. Lawrence" by P. M. Strain. Correspondence regarding the BIO publications should be directed to the Marine Assessment and Liaison Division, DFO, BIO, P.O. Box 1006, Dartmouth, N.S. Canada B2Y 4A2.

Early Pacific Science and Fisheries History

"Nature in Its Greatest Extent," edited by Roy MacLeod and Philip F. Rehbock, and subtitled "Western Science in the Pacific," has been published by the University of Hawaii Press, 2840 Kolowalu Street, Honolulu, HI 96822. MacLeod is professor of modern history, University of Sydney, Australia, and Rehbock teaches in the history and general science departments at the University of Hawaii and is also editing the *Challenger* letters of Joseph Matkin. Other contributors include John E. Bardach, Barry W. Butcher, David G. Frodin, Alan Frost, Miranda Hughes, Isabel Ollivier, Robert H. Randolph, Harry N. Scheiber, and O. H. K. Spate.

Most of the chapters were originally presented at the XVIIth International Congress of History of Science, University of California, Berkeley, 31 July-8 August 1985. This ambitious book spans the Pacific and nearly 300 years of discovery, but of special interest are the three chapters of Part III, "Pacific science in the making." Chapter 8 by Rehbock details the origins of and influences upon the Pacific Science Associ-

ation. He notes that among the 39 resolutions of the Pan-Pacific Science Conference of 1920 were that a comprehensive survey of Pacific fisheries be instigated, that surveys of Pacific flora and fauna be conducted, that Pacific exploration survey ships be financed by various governments, and that the Pacific Ocean bottom be mapped accurately.

Wilbert Chapman received scant mention in the history of the University of Washington's School of Fisheries, owing to his very brief tenure as its director. Here, however, he gets an entire chapter by Scheiber, "Wilbert Chapman and the revolution in U.S. Pacific Ocean science and policy, 1945-51." Chapman, who considered himself an ichthyologist, called himself a "biopolitician," and earned a Guggenheim Fellowship in 1947 for his blenny research, held a variety of important positions which he used to help engineer a wide variety of fisheries advancements.

In Chapman's view, the Pacific Ocean was "the Great Plains of the twentieth century." Discussed is his role in promoting legislation to create the Hawaii-based Pacific Oceanic Fishery Investigations (POFI), which is termed a "radical change in federal ocean research policy" as it helped win recognition for oceanography in the scientific community. Chapman's efforts to get state and Federal agencies and industry to coalesce and work together to attain common objectives are detailed, as are his efforts to promote the California sardine investigations, tuna studies, and his work with the U.S. Department of State on tuna, salmon, and halibut problems.

The Soviet Union has long attached great importance to the Pacific Ocean and its resources, and chapter 10, by Randolph and Bardach, discusses this at length, particularly in regard to marine biology. Noted is the growth in Soviet involvement in the Pacific Science Association and in marine research in the Pacific from about the early 1920's into the 1980's. Also discussed are Soviet investigations of overfishing, pollution, and habitat disruption, along with marine park establishment, mariculture advancements, etc. Also noted are a number of difficult political prob-

lems that have faced the Soviet sciences, including fisheries.

Another chapter of interest is "Seamen and scientists: The literature of the Pacific, 1697-1798." That period predates the specific marine science expeditions, but it provides interesting insights into the writings and temperaments of the explorer-captains of the era and the naturalists who sailed with them. Other chapters discuss European Pacific explorations, 1764-1806, for political purposes; surgeon-naturalist Pierre-Adolphe Lesson; observations of Tasmanian aborigines by Baudin and Peron in 1802; early New Guinean natural history work; science in colonial Australia; and the Funafuti expeditions of 1896-1904. Hardbound, the 288-page volume is indexed, costs \$34.00, and includes many notes and sources of information, and provides interesting historic insights into marine fisheries and oceanographic developments.

Conservation History in the Soviet Union

Publication of "**Models of Nature**" by Douglas R. Weiner, subtitled "Ecology, Conservation, and Cultural Revolution in Soviet Russia," has been announced by the Indiana University Press, Tenth and Morton Streets, Bloomington, IN 47405. Weiner is Assistant Professor of History at Tufts University where he specializes in the history of Russian and Soviet science.

This volume provides a good insight into little-known aspects of early Russian conservation efforts. It also sheds light on the evolution of ecological thought and work there, the nation's environmental problems, and what the author calls "the severely utilitarian view of nature held by the Stalinists. . ." Weiner discusses the beginnings of conservation in tsarist Russia and their evolution through the Communist revolution. Closely examined are the ecological and conservation efforts during the 1920's and 1930's and difficulties under the "Five-Year Plans," wherein various resource production goals were often set without regard for environmental reality.

The Soviets, the author points out, were among the first to set aside protected areas (zapovedniki) for scientific studies. But, as conservationists came under increasing criticism, the nature reserves were turned to production (even for exotic species like sika deer and raccoon dog) and predators were exterminated; many of the reserves were used for mining, lumbering, grazing, etc. Also detailed are struggles between those trying to protect the environment and others promoting huge hydroelectric projects, collectivization, etc. He tells further how Soviet conservation and ecology suffered under the attacks by I. I. Prezent, T. D. Lysenko, and others. Scientific beliefs or doctrines that did not support state social or economic policies were often deemed "counter-revolutionary."

The author also dispels a variety of myths regarding the role or fate of conservation under a strict, centrally planned economy. His concluding chapter, "Conservation without Ecology," specifically discusses the effects of Prezent and others who railed against those who would place "a theoretical land mine under our [socialist] construction." Besides a good review of the history of conservation under the Soviet socialist system into the 1950's, the book is also a reminder of the futility of trying to extract renewable resources faster than the environment can produce them. Definitions, acronyms, and abbreviations are given for Russian terms, an appendix lists nature reserves during 1925-33, and lengthy chapter notes are provided. Indexed, the 312-page hardbound volume costs \$35.00.

From Limnology to Oceanology

Recognition of the early contributions of limnology to the more holistic oceanographic studies seems to be growing. Thus, an account of Wisconsin's limnology community provides much material on the origins of this important field of study.

"**Breaking New Waters, A Century of Limnology at the University of Wisconsin**" by Annamarie L. Beckel

(with a contributed chapter by Frank Egerton), has been published as a special issue of the *Transactions of the Wisconsin Academy of Sciences, Arts & Letters* by the Academy, 1922 University Avenue, Madison, WI 53705. As the author puts it, "The development of the science of limnology is inextricably entwined with the careers of Edward Asahel Burge and Chancey Juday, and later with that of Arthur Davis Hasler." Indeed, Burge and Juday laid many of the foundation stones for American limnology, and this volume explores the origin and growth of the science at the University of Madison-Wisconsin and its Trout Lake Station. Their graduate students have also pioneered in fields as diverse as water pollution control, chemistry, marine microbiology, oyster studies, sea turtle migrations, Pacific tuna studies, salmon homing, fish reproduction, and more.

The book is a fine chronicle of developments in limnological work at the University of Wisconsin from Birge's arrival in 1875 to Hasler's retirement in 1978. Birge and Juday worked together for 40 years, leaving a record of some

400 scientific reports by their group. In all, perhaps 900 scientific contributions were produced between 1875 and 1978 and, along with the scientists schooled there, they have had a huge impact on both freshwater and marine science.

Essentially, the first chapters provide an "inside story" of the program and its development, often in the words of the three scientists themselves and, via interviews, in the words of their associates and students. Birge hired Juday in 1900 as a biologist for a state-sponsored survey study diel migration of zooplankton in southeastern Wisconsin lakes; ill health forced him to quit a year later, but he rejoined the survey in 1905 and the U.W. Zoology Department as a limnology lecturer in 1908. By then Birge was also University President, retiring in 1925 from that position at age 73. An authority on the taxonomy and ecology of Cladocera, Birge conducted research until 1941.

The classical descriptive-comparative limnological style of studies of Birge and Juday waned in the 1940's. Hasler, one of Juday's students who had been an assistant biologist with the U.S.

Bureau of Commercial Fisheries in the middle 1930's (working with Paul Galts-off at Woods Hole on the effects of pulp mill wastes on oysters), became a full professor at the University of Wisconsin in 1947 and led the limnological group into more structured experimental studies in the natural environment, notably salmon homing and winter limnological research among many others.

Egerton's chapter 5, then, is an overview of "The Wisconsin Limnology Community," in which he analyzes the achievements of these leaders of limnology, comparing and contrasting the evolution of their limnological program, discussing the similarities and differences in their aims, approaches, methods, and results. Altogether, the small volume provides a rare insight into the operation and evolution of a small but highly effective scientific group. Of interest also are more than 30 photographs of the individuals, their work, and the facilities; an appendix lists the Ph.D. students with Juday and the M.S. and Ph.D. students with Hasler. Paperbound, the 122-page volume is sold by the Academy for \$10.00.

Origins of U.S. Angling

It is difficult to determine precisely where fly fishing began in the United States, but Paul Schullery, in his "American Fly Fishing, A History," has done an admirable job in ferreting out the facts. The volume is published by Nick Lyons Books, Lyons & Burford Publishers, 31 West 21 Street, New York, NY 10010 and, again, the farther one goes back in fisheries history, the more one finds tied together between practices and practitioners.

Thaddeus Norris, who published "American Fish Culture" in 1869, is widely regarded, and properly so, as one of the "founders" of American fly fishing. His 1865 volume "The American Angler's Book," a landmark in fly fishing publishing, also included a chapter on fish breeding. Another pioneer fish culturist, Theodatus Garlick, who wrote the 1857 book "A Treatise on the Artificial Propagation of Certain Kinds of Fish," included instructions on fly fishing in it. And Livingston Stone, who founded the McCloud River fish hatchery in California for Spencer Baird, penned an article for *Forest and Stream* in 1875 relating the catching of large salmon of up to 21 pounds by fly fishermen there with "fine trout tackle."

Schullery begins with a look at old-world origins of the sport and, overall, this

is a superb volume on the history of American fly fishing from the time of the Pilgrims onward. It is thoroughly documented and very well written and illustrated. Specific chapters discuss the history of fly fishing, tackle developments, angling books and journals, and angling organizations. Saltwater fly fishing, he notes, has been discovered and rediscovered for well over a century in America. Indexed, the hardbound 278-page volume includes chapter notes and a lengthy bibliography; it costs \$29.95.

History of Fish Culture in the Australian Region

"Salmon at the Antipodes," subtitled "A History and Review of Trout, Salmon, and Char and Introduced Coarse Fish in Australasia" has been published by the author, John Clements, 22 Mimosa Avenue, Alfredton, Ballarat, Victoria, 3350, Australia. It is a most ambitious book, ranging from the middle 1800's to discussions of the benefits and detriments of fish introductions, the persons and groups involved, and much more. The author discusses the fish culture facilities of Comacchio (Italy), Huningue (France), Stormontfield (England), and others. He also reviews early antipodean fishermen, first attempts at shipping salmonids to

Australia and Tasmania, hatching the first ova, and more. Of equal interest are the many rare drawings and photographs of early fish culture operations and facilities in Australia, Tasmania, and Europe.

A lengthy section is devoted to Australian salmonid hatcheries and the "fish acclimatisation societies," and the various trout hatcheries of the Australian states. Another large section reviews the introduction of the many "coarse species" of fish. The author also reviews important work in New Zealand, Tasmania, and Papua New Guinea. In addition, he reviews the various salmonids themselves, including the Atlantic salmon, the brown, brook, lake, cutthroat, and rainbow trouts; Artic char, and the whitefish and grayling.

The chapter "American bits and pieces" reveals that the majority of salmonid species imported and acclimated to the region came from America. Other chapters provide additional information on the receipt of fish ova from the United States. Also discussed is the work of the Victoria Fisheries and Game Department and the role of various sportsmen's groups in introducing various fishes to Australia. Included is a lengthy bibliography and other information sources. Indexed, the 391-page hardbound volume is available from author Clements at \$38.50 plus \$8.20 postage and handling.