History of American Marine Biology and Marine Biology Institutions  
Introduction: Origins of American Marine Biology

RALPH W. DEXTER  
Department of Biological Sciences, Kent State University,  
Kent, Ohio 44242

SYNOPSIS. In the 1840s and 1850s professional naturalists dredged shallow sea-water on the eastern coast of the United States to obtain marine specimens for teaching and research. In 1871 Spencer F. Baird, first U.S. Commissioner of Fish and Fisheries, organized a marine biological laboratory at Woods Hole, Massachusetts, for basic biological research as well as for practical fishery biology. In 1873 Louis Agassiz established his summer marine station for teachers on Penikese Island, which stimulated others, especially some of his former students, to do likewise along the eastern coast in subsequent years, culminating in the renowned Marine Biological Laboratory at Woods Hole (1888). On the Pacific coast the pioneer marine laboratories were the Hopkins Marine Laboratory (1892) and the prestigious Scripps Institute of Oceanography in California (1903), and the Puget Sound Biological Station, later known as the Friday Harbor Laboratories, in Washington (1903). Today, over 50 marine laboratories are in operation in the 21 contiguous coastal states for education and research in marine biology.

INTRODUCTION

The formal study of American marine biology as a discipline goes back to the early nineteenth century. Following is a very brief sketch, the highlights, of its origin, and some of the pioneers who initiated the field and established laboratories in the continental United States which have had lasting influence.

In 1849 members of the Essex Institute at Salem, Massachusetts, observed William Stimpson of the Smithsonian Institution and Charles Girard of Boston dredge for marine life on a field trip at Manchester. In the 1850s Dr. Henry Wheatland of the Essex Institute followed this lead and dredged Salem Harbor for marine specimens. In 1854 Louis Agassiz, founder of the Museum of Comparative Zoology at Harvard University, added a room to his summer cottage in Nahant, not far from Salem, as a marine laboratory. Thus began a long tradition in promoting the study of marine life in a formal way by professional naturalists.

In 1871, Spencer F. Baird, Secretary of the Smithsonian Institution, newly appointed as the first U.S. Commissioner of Fish and Fisheries, organized the Bureau of Commercial Fisheries Biological Laboratory at Woods Hole, Massachusetts. While this laboratory was established primarily to help solve some practical fishery problems, it was Dr. Baird’s intention to include research on basic marine biology, and for many years field research and publications for such were produced at Woods Hole (see Galtsoff, 1962). Many of the pioneers of American marine biology carried out some of their field explorations or their laboratory studies under the sponsorship of this inaugural institution—G. Brown Goode, A. E. Verrill, E. B. Wilson, Alexander Agassiz, C. B. Wilson, F. B. Sumner, and H. B. Bigelow—to name only a few. A. E. Verrill’s “Report on the Invertebrate Animals of Vineyard Sound and Adjacent Waters” published in the commissioner’s first report for 1871–72 has become a classic volume in marine ecology (Verrill, 1873).

Upon the recommendation of one of his former students, N. S. Shaler, Louis Agassiz established and directed the Anderson School of Natural History, better known as Agassiz’s Penikese Laboratory, in the summer of 1873 (see Lurie, 1960). While it lasted for only two summer sessions, it had great impact on the study of marine life, and stimulated the later origin of other marine laboratories for education and research. Some of the Penikese instructors
were former students of Agassiz and included F. W. Putnam, A. S. Packard, E. S. Morse, Alexander Agassiz, B. G. Wilder, and D. S. Jordan (added in second year). Some of the students who later became well-known were D. S. Jordan, W. K. Brooks, S. W. Garman, C. O. Whitman, and Cornelia Clapp. The role of Agassiz’s students in organizing subsequent marine biological stations has been published in detail (Dexter, 1974).

In 1876, A. S. Packard, a former student of Agassiz and one of the Penikese instructors, established a Summer School of Biology at the Peabody Academy of Science in Salem, which included The Salem Marine Zoological Laboratory. F. W. Putnam, E. S. Morse, and Caleb Cooke, also former students of Agassiz, assisted with the instruction, especially for bottom dredging of Salem Harbor (Dexter, 1957).

In 1877 Alexander Agassiz opened his own marine research laboratory at New Port, Rhode Island, which he operated for 20 years for his own research and for a few selected, advanced students at Harvard’s M.C.Z. (Zinn, 1980). The following year W. K. Brooks established for Johns Hopkins University the Chesapeake Zoological Laboratory, first at Fort Wool, Virginia, but later moved around the coast from time to time (1878–1906) in Maryland, North Carolina, Massachusetts, the Bahamas, and Jamaica. Most often it was at Beaufort, North Carolina (McCullough, 1969; Benson, 1985).

In 1880 Alpheus Hyatt established the Annisquam Sea-Side Laboratory at Cape Ann, Massachusetts, under the auspices of the Boston Society of Natural History and the Women’s Educational Association of Boston which operated for seven years. Under the influence of Spencer F. Baird, Hyatt moved his laboratory to Woods Hole where it was reorganized as the Marine Biological Laboratory in 1888 with Hyatt as President of the Board of Trustees and C. O. Whitman as Director (Dexter, 1980; Maienschein, 1985). The history of that institution which became one of the most noted marine laboratories in the U.S. has been published in detail by Lillie (1944).

In 1891 the University Marine Biological Association, affiliated with the University of Pennsylvania, attempted to establish a marine laboratory at Sea Isle City, New Jersey. A brochure was issued describing the proposed building and its facilities, its program for both basic marine biology and fishery biology, and its selected faculty, but unfortunately the entire project suddenly collapsed (Pauly, 1984).

The next year the Hopkins Marine Laboratory was established at Pacific Grove in California by Stanford University, the first in a long series of marine stations on the Pacific coast (Ritter, 1915). In 1904 the Marine Station was organized at Friday Harbor, Washington (Benson, 1986), and the Scripps Institute of Oceanography was established by W. E. Ritter in La Jolla, California. Much has been published on the latter (Ritter, 1912, 1915; Raitt and Moulton, 1967; Shor 1980), the best known of the marine laboratories on the Pacific coast.

Back on the East coast, the Tortugas Marine Laboratory of the Carnegie Institution of Washington was established by A. G. Mayer (later, Mayor) on Tortugas Island in 1904 (Colin, 1980). Also early in the twentieth century, the Bureau of Commercial Fisheries Biological Laboratory at Woods Hole was still pursuing studies in basic marine ecology such as the classic works of Sumner (1908) and Sumner et al. (1913) on the marine communities of the Woods Hole region.

All of the 21 coastal states of contiguous United States now have marine laboratories. Among the best known are the following 50, many of which are described and illustrated by Vernberg et al. (1963) in the third volume of the American Zoologist.

**Selected American Marine Laboratories**

**Maine**—Mt. Desert Island Biological Laboratory (Salisbury Cove, Bar Harbor); Bigelow Laboratory for Ocean Sciences (W. Boothbay Harbor).

**New Hampshire**—Jackson Estuarine Laboratory (University of New Hampshire—Adams Pt.); Isles of Shoals Marine Biological Laboratory (University of New Hampshire—Isles of Shoals).
Massachusetts—The Marine Biological Laboratory, Woods Hole Oceanographic Institution, and National Marine Fisheries Service Biological Laboratory (Woods Hole); Marine Science Institute (Northeastern University—Nahant); University of Massachusetts Marine Station (Gloucester).

Rhode Island—Marine Laboratory (Graduate School of Oceanography, University of Rhode Island—Narragansett).

Connecticut—Marine Science Institute (University of Connecticut—Noank and Groton); Bingham Oceanographic Laboratory (Yale University—New Haven) (now inactive).

New York—Institute of Oceanography and Marine Biology (Oyster Bay); Cold Spring Harbor Laboratories (Long Island Biological Association—Cold Spring Harbor); New York Ocean Sciences Laboratory (N.Y. affiliated colleges and universities—Montauk).

New Jersey—Marine Science Center (Rutgers, the State University of New Jersey—New Brunswick); Sandy Hook Marine Laboratory (Highlands).

Delaware—Marine Biological Laboratories (University of Delaware Field Station—Lewes).

Maryland—Chesapeake Bay Institute (Johns Hopkins University—Baltimore); Chesapeake Biological Laboratory (University of Maryland—Solomons Island).

Virginia—Virginia Institute of Marine Science (College of William and Mary, and University of Virginia—Gloucester Point).

North Carolina—Duke University Marine Laboratory (Beaufort); Institute of Marine Science (University of North Carolina—Morehead City).

South Carolina—Baruch Institute for Marine Biology (University of South Carolina—Columbia); Fort Johnson Marine Biological Laboratory (College of Charleston—Charleston).

Georgia—University of Georgia Marine Institute (Sapelo Island).

Florida—University of Miami Institute of Marine Sciences (Virginia Key); Whitney Marine Laboratory (University of Florida—St. Augustine); Harbor Branch Oceanographic Institution (Ft. Pierce); Smithsonian Marine Station at Link Port (Ft. Pierce).

Alabama—Dauphin Island Sea Laboratory (Dauphin Island).

Mississippi—Mississippi State Gulf Coast Research Laboratory (Ocean Springs).

Louisiana—Coastal Studies Institute (Louisiana State University—Baton Rouge).

Texas—University of Texas Marine Science Institute (Aransas); Moody College of Marine Science (Texas A & M University—Galveston).

California—Allan Hancock Foundation (University of Southern California—Los Angeles); Scripps Institute of Oceanography (University of California—La Jolla); Kerckhoff Marine Laboratory (California Institute of Technology—Corona del Mar); Hopkins Marine Station (Stanford University—Pacific Grove); Bodega Marine Laboratory (University of California—Bodega Bay); Marine Science Institute (University of California—Santa Barbara); Institute of Marine Sciences (University of California—Santa Cruz); Moss Landing Marine Laboratory (California State Universities and Colleges—Moss Landing); Santa Catalina Marine Biological Laboratory (University of Southern California—Avalon); Pacific Marine Station (University of the Pacific—Dillon Beach); Marine Laboratory (Humboldt State College—Arcata).

Oregon—Oregon Institute of Marine Biology (University of Oregon—Charleston); Oceanographic Laboratory (Oregon State University—Corvallis).

Washington—Puget Sound Biological Station (Friday Harbor Laboratory) (University of Washington—Friday Harbor); Oceanographic Laboratory (University of Washington—Seattle).

REFERENCES


AMERICAN SOCIETY OF ZOOLOGISTS
APPLICATION FOR: STUDENT MEMBERSHIP
FULL MEMBERSHIP
CHANGE FROM STUDENT TO FULL MEMBERSHIP

NAME

MR.

MS.

POSITION

INSTITUTION

MAILING ADDRESS

TELEPHONE NUMBER

OFFICE: (_____) HOME: (_____)  

DEGREES

(INSTITUTIONS AND DATES)

SEVERAL SPECIALIZED AREA DIVISIONS HAVE BEEN ORGANIZED WITHIN THE FRAMEWORK OF THE AMERICAN SOCIETY OF ZOOLOGISTS. PLEASE CHECK THE DIVISION(S) OF THE SOCIETY WITH WHICH YOU WISH FORMAL AFFILIATION. IN GENERAL, IT IS BELIEVED THAT MOST MEMBERS WILL BE INTERESTED IN ONE OR TWO OF THE DIVISIONS. DESIGNATE PRIMARY DIVISIONAL AFFILIATION WITH LETTER “P.”

ANIMAL BEHAVIOR

ECOLOGY

COMPARATIVE ENDOCRINOLOGY

INVERTEBRATE ZOOLOGY

COMPARATIVE IMMUNOLOGY

SYSTEMATIC ZOOLOGY

COMPARATIVE PHYSIOLOGY & BIOCHEMISTRY

VERTEBRATE MORPHOLOGY

DEVELOPMENTAL & CELL BIOLOGY

HISTORY AND PHILOSOPHY

OF BIOLOGY

REQUIREMENTS FOR MEMBERSHIP. ARTICLE II, SECTIONS 2 AND 3 OF THE CONSTITUTION READ, IN PART, AS FOLLOWS: "ANY INDIVIDUAL WHO HAS HAD SCIENTIFIC TRAINING EQUIVALENT TO THE DOCTORATE, WHO IS ACTIVELY ENGAGED IN THE FIELD OF ZOOLOGY, AND WHO HAS BEEN NOMINATED BY A MEMBER OF THE SOCIETY SHALL BE ELIGIBLE FOR MEMBERSHIP. ANY POSTGRADUATE STUDENT IN BIOLOGICAL SCIENCE WHO HAS COMPLETED SUCCESSFULLY AT LEAST ONE FULL YEAR OF STUDY TOWARD AN ADVANCED DEGREE AND WHO HAS BEEN NOMINATED BY A MEMBER OF THE SOCIETY SHALL BE ELIGIBLE FOR STUDENT MEMBERSHIP"

I, ________________________, A MEMBER OF THE AMERICAN SOCIETY OF ZOOLOGISTS, NOMINATE THE ABOVE NAMED PERSON FOR MEMBERSHIP IN THE SOCIETY.

(SIGNATURE)

(DATE)

-------------------------------------------------------------------------------------------------------------------------------------

_____ DUES CHECK ATTACHED OR _____ PLEASE BILL AS FOLLOWS:
    MASTERCARD ACCOUNT NO. VISA ACCOUNT NO.  

EXPIRATION DATE  

SIGNATURE

MAIL THIS FORM TO:
MARY ADAMS-WILEY, EXECUTIVE OFFICER, AMERICAN SOCIETY OF ZOOLOGISTS, BOX 2739, CALIFORNIA LUTHERAN UNIVERSITY, THOUSAND OAKS, CA 91360.