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## Carl James Sindermann
## Honored Life Member

Among marine biologists and parasitologists around the world, the name Carl Sindermann is almost synonymous with books and articles on diseases of marine organisms. A background in fish and shellfish pathology, coupled with a talent for writing, propelled him into a successful career as a scientific author. Carl is a prolific and thoughtful writer, whose output includes not only scientific treatises, but books on the discipline of science and the scientists who practice it. Volumes that he has authored or co-authored are indispensable components of marine biology libraries worldwide.

Carl grew up in North Adams, Massachusetts, where he was born on August 28, 1922. After graduating from high school and working for two years for Pratt and Whitney, an airplane engine manufacturer in Hartford, Connecticut, he joined the US Army at the outbreak of World War II. Carl served as a medic in an infantry reconnaissance platoon, landing in Normandy a month after D-Day and moving with Patton's army through France, Germany, Austria, and Czechoslovakia before the war ended.

In 1946, Carl enrolled at the University of Massachusetts on the GI Bill. It was not until his senior year, however, that his interest in science was galvanized. A female faculty member, who, Carl recalls, was still an assistant professor after 20 years in the Zoology Department, assigned him a research project that became his senior honor's thesis: the study of an invasion of western Massachusetts by a large, predatory land planarian. Carl worked out the life cycle of this flat worm, which had been imported in soil from the tropics and was destroying natural earthworms in greenhouses—and launched into a career as a parasitologist. He had already been accepted at Purdue University when the head of the Zoology Department at the University of Massachusetts took Carl to visit colleagues at Harvard University. Carl was accepted on the spot to pursue a graduate program in parasitology.

Carl studied with the protozoologist, L. R. Cleveland, working on life cycles of parasites of wood-eating cockroaches. He shifted to the marine field for his PhD research, working with mycologist W. H. Weston. Carl's Dissertation was based on summer research at the US Fish and Wildlife Service Laboratory at Boothbay Harbor, Maine, where he studied a fungus disease of herring. While at Harvard, Carl became a teaching assistant in Parasitology and Tropical Public Health at the Harvard Medical School, and also an instructor at nearby Brandeis University where he taught undergraduate coarses in biology and invertebrate zoology. He also continued his association with the US Fish and Wildlife Service, serving as the Chief of the North Atlantic Herring Investigations. After obtaining his PhD from Harvard in 1953, Carl remained on the Brandeis faculty until 1956, when he elected to return to the Boothbay Harbor Laboratory and become a research biologist.

Carl remained at Boothbay Harbor until 1962, by which time the Laboratory, along with all US fisheries programs, had been transferred to the newly created Bureau of Commercial Fisheries (BCF). Carl's administrative skills were recognized within the Bureau, and in 1963 he moved to Maryland's Eastern Shore to become Director of the new laboratory at Oxford (now the Sarbanes Cooperative Oxford Laboratory). The Oxford Laboratory was built as a consequence of the epizootic mortalities of eastern oysters, caused by MSX disease, that had begun in the Delaware and Chesapeake Bays a few years earlier. The new laboratory specialized in disease studies of commercially important fish and shellfish, and under Carl's direction, its scientists played important roles in the early days of oyster disease research and the laboratory's reputation became known world-wide. In 1968, Carl left the mid-Atlantic for a new post as director of the BCF's Tropical Atlantic Biology Laboratory in Miami, Florida, a job that he held for the next 4 years. In 1971, Carl returned to the mid-Atlantic, this time New Jersey, where he became director of the Middle Atlantic Coastal Fisheries Center with headquarters at the Sandy Hook Laboratory of the National Marine Fisheries Service (NMFS-the old BCF). While at the Sandy Hook Laboratory, Carl added to his administrative duties by becoming Assistant Director for Environmental Managemnt of NMFS's Northeast Fisheries Center in 1976. While serving in these posts, Carl had written not only numerous articles and reports, but had also become a renowned book

author. In 1985, he withdrew from administration to devote full time to writing. From 1985 to 1990, he was an Intergovernmental Personnel Act Appointee, first at the University of Miami and later at the Maryland Department of Natural Resources, after which he returned to the Oxford Laboratory.

Throughout his career as a Federal employee, Carl retained close ties to academic institutions near his various postings. He held visiting or adjunct professorships at Georgetown, Florida Atlantic, Lehigh, and Cornell Universities, and the Universities of Miami, Guelph, and Rhode Island, where he taught invertebrate zoology, marine biology, fish pathology, and marine parasite ecology. He has served on the editorial boards of *Aquaculture, Cheasapeake Science,* the *Journal of Fish Biology,* the *Journal of Invertebrate Pathology,* and the *Proceedings of the National Shellfisheries Association.* He was the Scientific Editor of the *Fishery Bulletin.*

The honors and awards that Carl has received are too numerous to list, but a sampling shows the breadth of activities and interests that have occupied him during the past half century: member, Bureau of Commercial Fisheries advisory group to NASA on back contamination from lunar exploration, 1967; recipient of the Department of Commerce Silver Medal for administrative and research activities, 1975; chairman, New Jersey Sea Grant Advisory Board, 1981–1985; keynote speaker for the Sixth Symposium on Pollution and Physiology of Marine Organisms, Charleston, SC, 1983. He served as the President of the World Mariculture Society in 1980–1981, and was chosen as an Honored Life Member of the National Shellfisheries Association in 1991.

Although Carl has been a member of various international fisheries bodies, his work with the International Council for the Exploration of the Sea (ICES) is perhaps the most important. His affiliation with that organization began in 1959 when he attended his first meeting in Copenhagen. In the 1970s and 1980s he served on a number of ICES working groups, including those for Fisheries Improvement, Marine Aquaculture, Marine Pathology, and Introduced Species (of which he was chairman for a decade). His ability to synthesize and analyze great quantities of material was critical to the preparation of numerous reports for these groups, some of which served as the basis for later publications. An important contribution of these working groups was the issuance of the ICES "Code of Practice," which lists steps to be taken during the transfer of aquatic species to reduce the risks of disease spread when aquatic organisms are moved to new locations. The guidelines are used at present by most European countries and many US states.

Although Carl devoted much of his career to laboratory administration, he is best known as a book author. His scientific writing began as papers describing his research on marine parasites and pathology. His first publication (1953) was on "clam digger's itch," a human problem, but caused by a trematode parasite with a marine snail intermediate host. Carl's interests subsequently turned to parasites of the marine organisms themselves. Because he was in charge of the Atlantic herring project, his studies focused on this species, with a number of publications in the 1950s describing parasites and diseases of herring. Several of Carl's early papers showed that parasites could be used as tags to trace the movement of fish stocks. At the Boothbay Harbor Lab, Carl's work on serology of fishes resulted in a series of papers ranging from comparative serotyping of different fish species to the effects of disease on blood characteristics.

In the early 1960's Carl's genius for synthesizing material became evident in an article entitled "Disease in marine populations" (1963). Not long afterward, he teamed up with Oxford Lab colleague Aaron Rosenfield, whom he had met while both were on the faculty of Brandeis University, to produce the now classic paper "Principal diseases of commercially important marine bivalve Mollusca and Crustacea," published in the Fishery Bulletin in 1967. In 1970, Carl expanded his earlier work in a volume entitled "Principal Diseases of Marine Fish and Shellfish" (Academic Press), which won the Wildlife Society of America award for best scientific publication in fisheries for 1970. Carl later updated this important work, which was re-issued in a 1990 two-volume set. These publications are acclaimed not only for the breadth of material included and the depth of analysis, but for the clarity of language and illustrations. His growing interest in aquaculture led to another indispensible book for the aquatic pathologist: "Disease Diagnosis and Control in North American Marine Aquaculture," edited by Carl and published in 1977 by Elsevier. This volume was also updated, in 1988, and in collaboration with Don Lightner.

While director of the Sandy Hook Laboratory, which is situated on the shore of the New York Bight, it was natural, perhaps inevitable, that Carl's attention would be drawn to the effects of coastal pollution on marine organisms. Once again, he meshed his surehanded grasp of disease processes in the marine environment with what he was learning about pollution in a series of publications showing links between environmental contaminants and disease in marine fish. One of his most recent books, "Ocean Pollution—Effects on Living Resources and Humans" (1996, CRC Press) is an outgrowth of these concerns.

Carl's enthusiasm for writing has led him into areas not often entered by scientists: writing about the scientists themselves. His first foray, entitled "Winning the Games Scientists Play" (1982, Plenum) elicited enthusiastic reviews, and some consternation among a few colleagues who recognized themselves in the vignettes he used as illustrations. "The Joy of Science" (Plenum) was published in 1985, followed in 1987 by "Survival Strategies for New Scientists" and in 1992 by "The Woman Scientist" (co-authored by Clarice Yentsch). Carl's most recent offering, written in collaboration with Tom Sawyer, is entitled "The Scientist as Consultant: Building New Career Opportunities" (1997). The books show Carl to be a keen observer of scientists and an accurate reporter of their behavior. They have an underlying theme: to analyze, often with a lighthearted touch, what makes a person successful in the scientific profession. They are realistic, discussing both pros and cons of certain career paths, and contain a wealth of practical advice—valuable not only for those considering or just embarking on a scientific career, but with admonitions that individuals well along in their professions would do well to follow.

Carl and his wife Joan are the parents of two daughters (both social scientists) and three sons (all in construction). When Carl retired in 1991, he and Joan decided to remain on the Eastern Shore near the Sarbanes Cooperative Laboratory. Carl continues to come into his office at the Laboratory, to use the library, to chat with Aaron Rosenfield over lunch, and to work on yet another addition to the long list of publications under the Sindermann name. His current work in progress is tentatively titled "Rhyme of an Ancient Scientist: the Aging Scientist in Today's Society."

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