



*C. H. Hambleton*

## CHRISTIAN J. LAMBERTSEN

1917–2011

Elected in 1977

*“For contributions to environmental science and to diving physiology and technology.”*

BY TOM HAWKINS

SUBMITTED BY THE HOME SECRETARY

CHRISTIAN J. LAMBERTSEN, a distinguished scientist, medical doctor, inventor, environmentalist, pioneer in undersea and aerospace medicine, and professor at the University of Pennsylvania School of Medicine for his entire adult life, died on February 11, 2011, at the age of 93. He excused himself from daily activities at the university only in the past several years, when he was forced to slow down because of physical incapacitation. He was held in especially high regard by the U.S. Navy SEALs, who considered him a friend, mentor, and “Father of U.S. Combat Swimming,” a title he very much appreciated.

Dr. Lambertsen received a B.S. degree from Rutgers University in 1938 and his M.D. degree from the University of Pennsylvania in 1943. His extraordinary lifetime of accomplishments began during involvement with the Office of Strategic Services (OSS) during World War II when, as a 23-year-old medical student, he presented his invention of a self-contained underwater swimming apparatus. Once developed, it was called the Lambertsen Lung and eventually the Lambertsen Amphibious Respiratory Unit (or simply LARU). The LARU would enable a well-trained swimmer to work bubble-free underwater and thus operate around

objective areas without detection from above. The OSS immediately understood the LARU's potential and quickly embraced the concept.

Upon completion of his medical training, Dr. Lambertsen was commissioned in the U.S. Army Medical Corps and attached for service with OSS, specifically to take advantage of his expertise in underwater operations. He became instrumental in establishing the OSS Maritime Unit as the unit's medical officer and primary trainer of its operational swimmers, including development of tactical functions of the LARU and a swimmer submersible. After the surrender of Japan and before being reassigned to hospital duty in Atlanta, Georgia, Dr. Lambertsen did everything he could to protect and save the Maritime Unit's diving equipment, since OSS was disbanded almost immediately in September 1945.

Dr. Lambertsen joined the University of Pennsylvania medical faculty in 1946 and became a professor of pharmacology in 1952. While a faculty member, he continued to combine diving research and underwater equipment developments and began a one-man campaign to introduce OSS diving capabilities to the Navy's Underwater Demolition Teams (UDTs), the U.S. Coast Guard, and the U.S. Army Corps of Engineers. In 1947 he wrote a lengthy letter to the chief of naval operations summarizing underwater swimmer capabilities.

The UDTs fully adopted OSS capabilities, which were called simply "Submersible Operations" and were immediately classified to protect the tactics and techniques being used. This was a seminal period for the UDTs, since the LARU and OSS tactics vastly improved their maritime special operations potential. Capabilities introduced by Dr. Lambertsen also included use of the British submersible canoe *Sleeping Beauty*, which would lead to decades of UDT and SEAL team combatant submersible refinement, organization of the U.S. Navy SEAL delivery vehicle teams, and modification of U.S. Navy nuclear submarines for dedicated support of SEALs. Indeed, his expertise in all areas of underwater operations placed him at the forefront of this rapidly developing field.

In 1952, Dr. Lambertsen and a colleague wrote a paper for the National Academy of Sciences describing his "Self-Contained Underwater Breathing Apparatus," which resulted in the acronym SCUBA.

From 1952 to 1960, Dr. Lambertsen served as a distinguished member of the Office of Naval Research's Cooperative Underwater Swimmer Project and on the National Research Council Committee on Amphibious Operations Panel on Underwater Swimmers. He also served as member of the Assistant Secretary of Defense Advisory Panel on Medical Science, as a member of the U.S. Air Force Scientific Advisory Board, as a consultant to the U.S. Army Chemical Corps, and as chairman of the National Research Council Panel on Shipboard and Submarine Medicine. His work with the federal government continued through the 1990s, with service on the U.S. Navy's Oceanographic Advisory Committee and as a member of the U.S. Special Operations Command's Medical Advisory Board for the Advanced SEAL Delivery System.

Dr. Lambertsen's medical research expanded to the earliest days of the National Aeronautics and Space Administration's (NASA) manned space program, where he actively participated in advancing man's capability for space exploration. In 1960 he served as a member of the Space Sciences Board of the National Academy of Sciences and as chairman of the Committee on Man-in-Space, providing oversight to eight subordinate panels covering a variety of disciplines.

From 1960 to 1967 he was chairman of the Life Systems Advisory Board for the Mercury and Gemini projects. Throughout the 1970s and 1980s he remained actively engaged in scientific research surrounding man's ability to handle the environmental stresses of space. He was a member of the President's Space Panel from 1967 to 1970 and from 1983 to 1986 served as chairman of the Environmental Science Review Committee as a member of NASA's Space Medicine Panel on the Lunar Base Planning Group. Dr. Lambertsen's work with NASA continued into the 1990s with participation in a Radiation and Environmental Health Working Group, Life Sciences Division Environmental Biomedical Sciences

Working Group, and Hubble Telescope Repair Project. From 1998 to 2000 he served as chairman of NASA's Advisory Committee on the International Space Station Decompression Risk Definition and Contingency Plan.

Dr. Lambertsen's impact on science and the military earned him numerous honors, including the Alumni Award of Merit from the University of Pennsylvania and in 1989 the Distinguished Graduate Award from the Perelman School of Medicine—the highest honor bestowed on alumni. He was also presented the Legion of Merit Award and the Distinguished Public Service Medal in 1972, the highest award bestowed on a civilian by the U.S. Department of Defense; the U.S. Coast Guard's Distinguished Public Service Award in 1976; the U.S. Army Special Forces Green Beret Award in 1996; the national UDT-SEAL Association Lifetime Achievement Award in 1999; and the U.S. Special Operations Command Medal in 2001. He was elected to the National Academy of Engineering in 1977. He also received the New York Academy of Sciences Award for Research in Environmental Sciences, the Pioneer Award of the Navy Historical Society, and in 2010 the John Scott Award from the Philadelphia Board of Directors of City Trusts, which previously honored Marie Curie, Thomas Edison, and Jonas Salk. In May 2011 the U.S. Special Operations Command honored him with establishment of the "Dr. Christian J. Lambertsen Award for Operational Innovation," which will be presented annually.

Dr. Lambertsen's most significant and crowning achievements undoubtedly came in 1967 and 1968, when he served as founding president of the Undersea Medical Society (now Undersea and Hyperbaric Medical Society) and established the University of Pennsylvania's Institute for Environmental Medicine and its companion Environmental Biomedical Stress Data Center, where researchers continue to explore the pathophysiology of oxygen toxicity, diving-related diseases, and mechanisms of hypoxic response. His service to our country as a combat veteran, an educator, a medical doctor, an inventor, and a distinguished citizen represents a lifetime of achievement. His impacts on diving physiology, undersea

and hyperbaric research and medical treatments, hydrospace sciences, biomedical sciences, and environmental sciences were without equal.

Dr. Lambertsen is survived by his sons Christian Jr., David, Richard, and Bradley and by six grandchildren. His wife of more than 40 years, Naomi Hill Lambertsen, died in 1985. His son, Christian, remembers his father as being dedicated to his family, immediate and extended, and that he was an adventuresome sailor. As an environmentalist, he was active in land preservation along the shores of his farm, called Lostock, near St. Michaels, Maryland.