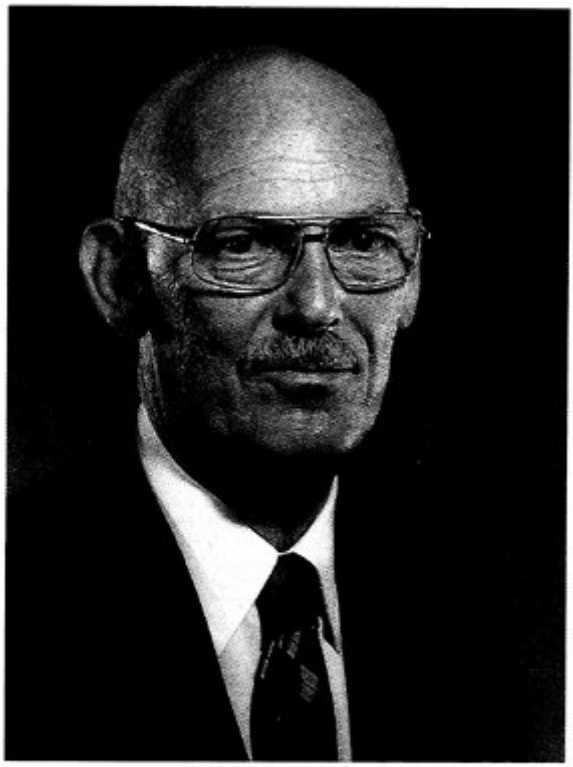

Howard D Eberhart

HOWARD DAVIS EBERHART

1906–1993

BY BORIS BRESLER, EGOR POPOV, EDWARD WILSON, AND ALEXANDER SCORDELIS

HOWARD EBERHART, one of the University of California at Berkeley's most highly respected and acclaimed teachers in civil engineering, and a pioneer of research in artificial limbs, died of a heart attack on July 18, 1993, while he was returning from Arizona to his home in Santa Barbara.

He was born August 16, 1906, in Lima, Ohio, and attended the University of Oregon in Eugene from 1924 to 1929, graduating with a B.S. degree in architecture. After teaching high school mathematics and science and coaching athletic teams in the state of Washington, he returned in 1933 to Oregon State College in Corvallis, where he received an M.S. degree in civil engineering in 1935. His first appointment at the University of California, Berkeley, was as an instructor in 1936, after which he rose through the professional ranks to become a full professor of civil engineering in 1948. He served twice as chairman of the Department of Civil Engineering from 1959 to 1963 and 1971 to 1974. Throughout his academic career at Berkeley he played a leading role in the growth and development of the Department of Civil Engineering such that the program attained a ranking of first in the nation. After he retired from Berkeley in 1974, he spent three years in Saudi Arabia establishing the Civil Engineering Department at King Abdul Aziz University of Jidda. During the period from 1980 to 1991, he was invited to teach courses in the College of Engineering at the University of California, Santa Barbara.

Professor Eberhart was an outstanding teacher and student adviser and an inspiration to other faculty members. His unique style of teaching made him a particular favorite of students. He received several teaching awards from student organizations at Berkeley and Santa Barbara. Many Berkeley civil engineering alumni, ten, twenty, and thirty years after graduation, have identified him as one of the most important influences on them during their studies at Berkeley. At the memorial service, a plaque dedicated to him stated, "In honor of the memory of a great teacher, who had a major impact on the lives of many Berkeley students, who will always remember him."

Important as his contributions were in teaching and university service, outside the university he was known primarily as one of the leaders in research and development of artificial limbs. Because of his expertise in analytical and experimental studies on many types of structures, he participated in research during World War II aimed at improving concrete runways to withstand the stresses due to heavy bombers. In 1944, during a nighttime test at Hamilton Field in Marin County, California, a heavy truck simulating the weight of a bomber rolled over his leg, requiring amputation below the knee.

The event was a turning point in his life. Striking up a friendship with the surgeon who amputated his leg, Verne Inman, M.D., Ph.D., and professor of orthopedic surgery at the University of California Medical Center in San Francisco (now U.C. San Francisco), he discovered that while prosthetics were generally crafted to the individual, this was done without much thought as to how well they worked as a replacement limb.

As war casualties returned from Europe and the Pacific, the government discovered the same thing, and set up a National Research Council (NRC) Advisory Committee on Artificial Limbs to remedy the situation. In 1945, when the committee approached Dr. Inman to do research on artificial limbs, Inman invited Professor Eberhart to collaborate with him. For the next thirty years they formed a partnership that placed them in the forefront of the national effort in artificial limb research and development.

Together they established in 1945 the Prosthetic Devices Research Project in the Berkeley Department of Engineering under Howard Eberhart's direction. It was sponsored first by the surgeon general of the U.S. Army and later by the Veterans Administration.

This cooperative project between the Department of Engineering in Berkeley and the School of Medicine in San Francisco was unique in that it focused on fundamental studies of engineering mechanics of human locomotion, and on the medical, scientific, and clinical aspects of limb replacement. In this early example of an interdisciplinary project, a team of engineers and surgeons successfully began to lay a foundation in biomechanical principles for the intelligent design of artificial limbs.

In the mid-1950s the research shifted from mechanics of locomotion and design criteria for artificial limbs to clinical studies of the amputees. In 1957 the Prosthetic Devices Research Project became the Biomechanics Laboratory and was moved to the Medical School in San Francisco. In 1967 it returned to Berkeley, and finally ceased to exist in 1974 when the Veterans Administration was not able to support it any longer.

Howard Eberhart directed the project for the first ten years and then continued as one of the faculty investigators first with Verne Inman and later with Chuck Radcliffe. From 1960 to 1966 he served as member-at-large of the National Research Council in the Division of Engineering and Industrial Research, and from 1959 to 1962 he served as the chairman of its Committee on Prosthetic Research and Development. In 1970 he was honored by the NRC at a banquet in Washington, D.C., for his three-year stint as chairman.

In 1977 Howard was elected to membership in the National Academy of Engineering. The citation read: "For pioneering studies of human locomotion, application of structural engineering to prosthetic devices, and leadership of interdisciplinary engineering research."

For almost thirty years Howard Eberhart devoted his professional life to the holistic improvement of prosthetic devices: he was concerned not only with the design of better devices but also with fuller rehabilitation of the amputee. He made

sure that the new knowledge was delivered to the field through seminars, workshops, and special publications directed at the artificial limb industry and limb fitting profession. In this he displayed the vision of a great teacher.

Professor Eberhart is survived by his wife, Frances; a sister, Mary Ellen Henderson of Eugene, Oregon; a son, Howard Davis Eberhart II of Concord, California; and two grandsons.