



IN MEMORIAM

Donald N. Hanson
Professor of Chemical Engineering, Emeritus
UC Berkeley
1918 – 2007

Donald N. Hanson, professor emeritus of chemical engineering at the University of California, Berkeley, and an inspiring teacher and mentor, died on January 11, 2007 in Orinda, California, following a year of illness and hospice care. He was 88.

A world- renowned expert on chemical distillation processes, Hanson was the last surviving member of the original group of faculty that launched the chemical engineering program at Berkeley after World War II. The others included LeRoy Bromley, Charles Tobias, Theodore Vermeulen, Charles Wilke, and Campbell Williams.

Hanson was born in Minooka, Illinois, on August 3, 1918, and grew up in Geneva, Illinois. He earned his B.S. from the University of Illinois in 1940, and his M.S. in 1941 and Ph.D. in 1943 from the University of Wisconsin, Madison. Before beginning his 40- year career at UC Berkeley in 1947, he served as an instructor at the University of Wisconsin and at Kansas State College. He and his wife of 63 years, Sally, met at the University of Wisconsin when she was an undergraduate and he was teaching as a newly minted Ph.D. He also spent two years as an engineer working for Shell Development Company in the Bay Area. He earned tenure at UC Berkeley in 1953 and was promoted to full professor in 1958. Hanson was chairman of the Department of Chemical Engineering from 1963 to 1966, and served for many years as its director of graduate admissions.

Hanson was one of the very first in chemical engineering to explore the uses of digital computation for analyzing multicomponent, multistage separations, such as distillation, absorption and extraction. Such separations require elaborate computations because they are described by a large set of underlying equations, which must be solved by successive- approximation methods. He created actual computer programs, and in so doing devised his own innovative methods of structuring the computations and bringing them to convergence. Several of these methods survive in evolved form in computational approaches used today. This work was reflected in the 1962 book, *Computation of Multistage Separation Processes*, which he wrote jointly with Duffin and Somerville. He supplemented those efforts with interests in the minimum reflux phenomenon in multicomponent distillation and published important papers on that subject.

In relation to this work, Hanson collaborated with colleagues at Lawrence Livermore National Laboratory and elsewhere to examine methods of separating hydrogen and its isotope, deuterium, on a large scale. Deuterium was needed in the national defense effort and in heavy water moderated nuclear reactors. Separation processes involving very many stages are required for that separation, too.

Another important contribution reported in the 1962 book by Hanson, et al., was the Description Rule, a deceptively simple, yet very effective method for identifying the number of independent variables that could be predefined in calculations of complex multistage separation processes.

Following his work on computation of multistage separation processes, Hanson turned to studies of behaviors of particles and droplets in electric fields, devising methods for measuring concentrations and surface areas of droplet clouds and using charged droplets to assist in electrostatic precipitation. He then joined forces with his faculty colleague Scott Lynn to examine a variety of methods for concentrating aqueous solutions by extracting water from them and taking advantage of the sensitivity to temperature changes of the solubility of water in the solvent.

Hanson taught a variety of courses over the years, including elements of chemical process analysis and separation processes. In 1986, he received UC Berkeley's coveted Distinguished Teaching Award. At the time, Hanson was praised by a past student because "his love of teaching and detailed knowledge of the material combine to spark a contagious enthusiasm." In accepting the award, Hanson, who also mentored more than three dozen graduate students, wrote, "The first criterion for successful teaching must be the desire to pass on knowledge — with an acceptable payment for the effort being little more than the satisfaction of seeing the transfer take place."

His colleagues remember Don as a beloved member of the faculty, whose benevolent, often self-sacrificing devotion to students and colleagues was remarkable. Former students also recalled him as the most motivating teacher they had ever met at Cal, who had the ability to impart his limitless enthusiasm to his students. He was truly a great teacher, mentor and friend.

Hanson was a principal investigator at Lawrence Berkeley National Laboratory and consulted for the Lawrence Livermore and Los Alamos national laboratories. Hanson also consulted for Bechtel Corporation and Beckman Instruments. From 1956 to 1958, he was a visiting professor at the University of the Philippines in Quezon City, near Manila. He was a member of the American Institute of Chemical Engineers and the American Chemical Society.

Don Hanson also had many nonprofessional interests, including reading, travel, art and craftsmanship. He and his brother-in-law built the family cabin at Lake Tahoe in 1948. Following his retirement from Berkeley in 1989, Hanson devoted himself to traveling with Elderhostel, woodworking, and spending time with his children and grandchildren.

In addition to his wife, he is survived by his sons, Charles of Walnut Creek, California, and David of Davis, California; daughter, Kristin, of Bend, Oregon; and seven grandchildren.

Alexis T. Bell
C. Judson King
John S. Newman