



IN MEMORIAM

Frank Hauser
Professor of Mechanical Engineering, Emeritus
UC Berkeley
1924-2013

Frank Hauser, professor emeritus of mechanical engineering at the University of California, Berkeley, passed away peacefully at home on February 23, 2013. He is survived by his wife Lorraine of 63 years, their two sons, Mark, an M.D. in emergency medicine, and Craig a Ph. D. scientist in genetics and molecular biology, and four grandchildren. He was 88.

Born in Germany he came to the U.S. at the age of 13 to San Francisco and later to Napa, California where he graduated from high school. Professor Hauser earned his Bachelor's degree in 1948 and his Master's degree in 1950 both in Mechanical Engineering at UC Berkeley, and his Ph. D. in Metallurgy in 1956 also from UC Berkeley. After being an undergraduate for just a year, Professor Hauser joined the US Army where he worked on radar installations in the Pacific, one of the most highly classified projects at the time. He returned to UC Berkeley to complete his education. After his Ph. D., Professor Hauser joined the UC Berkeley faculty in 1956, retiring in 1990.

Professor Hauser's background in both mechanical engineering and materials instilled in him a multidisciplinary ability that was rare, particularly among academia in engineering. Professor Hauser established one of the first graduate courses on mechanical behavior of materials with applications to mechanical design. This course was unique at the time in integrating materials with design for mechanical engineering students. Until then, the conventional approach in engineering schools was to teach materials in the metallurgy department where the emphasis was on microstructure and properties with little or no coverage on how these materials were applied to actual mechanical engineering systems.

Professor Hauser's course in the practice of engineering was very significant at the time reflecting his strong belief that the reliability and safety of machinery is ensured through a thorough understanding of how materials behave within the constraints of specific applications. He also taught for many years, a required two- semester course on mechanical design for seniors that he also initiated. This course required the completion of challenging projects in design, painstakingly created by him, where students submitted drawings of complete assemblies of machinery and devices that they had designed that would meet the requirements he had specified. Some of these innovative projects included a ball throwing machine, sheet music page- turner, a tree climbing limb remover, and assistive devices for the disabled.

Professor Hauser was one of the best teachers in the Mechanical Engineering Department consistently earning outstanding teaching evaluations. He constantly supplemented his lectures with real- world examples of the performance of mechanical devices, and the design and materials- related factors that could cause them to fail. He was a major influence in the restoration and upgrading of the San Francisco cable car system, the Bay Area Rapid Transit at the start of its construction, and in establishing inspection criteria for aircraft manufacturers and airlines to prevent fatigue failure. These examples that he brought to his classes were highly appreciated by his students and many would find them to be of great use in their careers.

His scope of research included theoretical and experimental studies of the basic phenomena of plastic deformation, fatigue, and fracture in materials. His research emphasis was on mechanical behavior at high deformation rates, and fatigue behavior, including that of bolted joints. As an experimentalist, he could personally operate any of the equipment and instrumentation in his laboratory. Hari Dharan, one of his Ph. D. students (now a professor of mechanical engineering at Berkeley) recalls a time when, after struggling for several days to get a piece of equipment to work: “Frank came into the lab, rolled up his sleeves, and got everything to work in no time. He was completely at home in the laboratory and in the classroom”.

Professor Hauser’s pioneering research papers on high strain- rate behavior (how materials behave when loaded at very high velocities) reported on measurements, taken for the first time of material behavior when loaded to failure in less than one- millionth of a second, a very impressive achievement, given that this was in the 1960’s, well before the advent of high- speed microelectronics. Another of his former Ph. D. students, Wayne Nguyen Hung, Professor of Mechanical Engineering at Texas A & M University recalls, “In addition to being a conscientious academic, Frank was a true mechanical engineer – he could fix any problem involving materials and design, yet was always modest and unassuming, and always helpful to his students”.

Besides being the author of a number of technical papers, Professor Hauser served as expert witness for court cases involving technical problems in the field of metallurgical engineering with particular emphasis on fracture analysis involving the interaction of materials and design. The Atomic Energy Commission (the current Department of Energy) supported most of his research in the areas of high strain- rate behavior, as well as creep and high- temperature alloy steels. He was recognized for his work in 1959 with the award of the Henry Marion Howe Medal from the American Society for Metals established to “honor the author whose paper has been selected as the best of those published in Metallurgical Transactions”.

Professor Hauser was a registered Professional Metallurgical Engineer in the State of California and a member of the American Society for Metals, the Society for Experimental Stress Analysis, American Association for the Advancement of Science and Sigma Xi. He was a Life member of the Sierra Club, Save the Redwoods, and Save the Bay in line with his passionate interest in protecting the environment. He loved the outdoors, hiking and camping, and was an avid sailor and skier.

Hari Dharan