



Lydik S. Jacobsen

Lydik Siegumfeldt Jacobsen

1897-1976

By John A. Blume

Lydik Siegumfeldt Jacobsen, Stanford University Professor Emeritus, Member of the National Academy of Engineering, Past President and Honorary Member of the Seismological Society of America, and first President of the Earthquake Engineering Research Institute, died on December 22, 1976, following a stroke.

Dr. Jacobsen was internationally known for his pioneering work in determining the dynamic characteristics of buildings and other structures and their response to earthquake ground motion and other disturbances, as well as for his research and teaching in vibrations and dynamics. He directed the Vibration Laboratory at Stanford University from 1926 until his retirement, in 1962, and was Head of the Mechanical Engineering Department from 1949 to 1961. He coauthored, with Robert S. Ayre, a standard text, *Engineering Vibrations* (McGraw Hill, 1958), and he wrote many technical papers.

Lydik Jacobsen was born June 17, 1897, in Nyborg, Denmark, where his father owned a steam-powered flour mill. After completing the Danish equivalent of an American high school education, Lydik worked in various flour mills and at a fish hatchery, where he enjoyed manual labor. In 1917, his father, Hans Christian Jacobsen, sold his mill and took his wife and five children, including Lydik, to California. Lydik began work in the Sperry Flour Mill in Stockton, California, where he soon supervised all machinery on one floor. Because of his growing interest in the mechanical aspects

of milling, he was encouraged to attend Stanford, where he obtained his Bachelor of Arts degree in mechanical engineering after three years of accelerated study. In 1921 he became a junior engineer with Westinghouse Electric Corporation in Pittsburgh, Pennsylvania, where he worked with S. Timoshenko. In 1924 Professor Durand, another engineer who later became famous, persuaded Lydik to return to Stanford for graduate study and provided him with an instructorship as a source of financial aid.

In 1927 Lydik obtained his Doctor of Philosophy degree in physics at Stanford and also became a U.S. citizen. That same year, with some financial aid obtained by Dr. Bailey Willis, he started a vibration laboratory at Stanford with a large shaking table. The combination of the 1925 Santa Barbara earthquake, Dr. Willis' aid and encouragement, and the opportunity to apply his knowledge of vibration from physics and mechanical engineering all contributed toward developing Dr. Jacobsen's interest in the problem of how buildings respond to earthquake-induced ground motion.

In 1931 Dr. Jacobsen was awarded a Guggenheim fellowship in applied mechanics that enabled him to visit universities and laboratories in five European countries. He became a Full Professor in Mechanical Engineering at Stanford in 1936. He was a Visiting Professor at the University of Michigan in 1938 and at the Illinois Institute of Technology in 1941. During a leave from Stanford in 1953 and 1954, he was a Fulbright Professor at Den Polytekniske Laeranstalt (the Danish Polytechnic Institute) in Copenhagen. After he retired from teaching, in 1962, he cofounded Agbabian-Jacobsen Associates, a consulting engineering firm, in which he was active until he retired in 1969. He continued his individual consulting practice until his death.

During World War II, he analyzed 271 U.S. Navy ships of all types and served aboard 130 of them to study ways to reduce sounds and vibrations and thus decrease detection by enemy submarines. He left the service in 1946 as a Commander in the Naval Reserve and with a U.S. Navy Commendation Medal.

Dr. Jacobsen published about forty scholarly, thorough, and precisely written papers involving a great deal of thought and

effort on new subject matter in whose development he, personally, had played either a sole or a major role, including mechanics, stress analysis, vibrations, models, dynamic behavior of models, damping, shock, blast effects, ship vibrations, hydrodynamics, shaking table research, mathematics, and earthquake motion. In addition to his published works, he wrote many reports, both public and private, for clients during his decades of consulting work for industry and Government; such unpublished reports by a consultant of Dr. Jacobsen's caliber often involved more complexity, discovery, and innovation than was generally found in his published works.

Dr. Jacobsen received many honors and awards, but no doubt fewer than he deserved because of his frank honesty in all matters and also because his audience's understanding rarely matched his own. He was a pioneer in earthquake dynamics, but he was also a mechanical engineer, a mathematician, and a physicist who attempted to explain new and complex building dynamics to structural engineers, architects, and public officials. The work was made more difficult with warning public interest in such matters shortly after each damaging earthquake.

He was elected to the National Academy of Engineering in 1975; his citation was for "outstanding research, teaching, practice, and writing in mechanical and structural vibrations and shock." He served as President of the Seismological Society of America from 1953 to 1955 and was elected an Honorary Member in 1974. He was Chairman of the U.S. Coast and Geodetic Survey's Advisory Committee on Engineering Seismology from 1947 to 1949. He was one of the founders and the first President of the Earthquake Engineering Research Institute in 1949 and was elected an Honorary Member in 1969. He was a Fellow of the American Society of Engineering Education. His accomplishments are listed in *Who's Who in America*, *Who's Who in Engineering*, *American Men of Science*, *Blue Book of Denmark*, and *Danes in the World*.

Lydik Jacobsen was a dynamic person in every sense of the word—intelligent, vigorous, enthusiastic, energetic, friendly, fluent, greatly interested in people as well as in science and engineering, and a dedicated worker with much endurance. He

enjoyed his work, especially research or a challenging, difficult problem. He was proud of the fact that, in 1975, eight of his former students were members of the National Academy of Engineering.

Lydik Jacobsen was respected by all his peers, even those who might not always agree with him. Some of Dr. Jacobsen's work—for example, his development of the phase-plane-delta method of treating inelastic, nonharmonic, vibrating systems—would have been much more widely applied had it not been for the computer, which later made such procedures unnecessary. The same is true of his dynamic (mechanical) models of buildings tested on the shaking table, which were replaced by electric analogs or by high-speed digital computers. Nevertheless, the pioneering innovation was there, and it helped to provide a solid base for later development with more exotic equipment. Lydik Jacobsen's pioneering work in vibrations and in approaching the earthquake problem as one of dynamics rather than statics was a great milestone that shall always be on record, remembered by all who knew him, and appreciated in the future by those who did not know him.

Dr. Jacobsen's survivors, besides his widow Mary Louise of Laguna Hills, California, include his first wife, Doris (Wetzel), of Menlo Park; two sons, Erland, of Fresno, and Ian, of Honolulu; and a daughter, Ellen Yazar, of Ankara, Turkey. His brother, Theodor, a retired professor of astronomy, lives in Seattle; a sister, Ingrid Wilson lives in Los Angeles; and two sisters, Kirsten Gregersen and Lisse Lindman, live in Santa Barbara.

