

MEMORIAL RESOLUTION

STEPHEN P. TIMOSHENKO (1878 – 1972)

Professor Emeritus Stephen P. Timoshenko, world-renowned authority on theoretical and applied mechanics, died, on May 29, 1972 at the age of ninety-three. Throughout his long and productive life, Timoshenko enjoyed excellent health and seemed always to be in high spirits. His refreshing interest in life continued unabated into his last years, and the end came somewhat suddenly after, a short illness from a kidney ailment. He died in his daughter's home in Wuppertal, Germany, where he had been living since 1964. Prior to that time, he had lived for many years in his own home on West Crescent Drive in Palo Alto.

Timoshenko's accomplishments in the field of applied mechanics and his impact on engineering education in the United States were truly remarkable. His widespread influence as a teacher and writer has resulted in frequent references to him as "the father of applied mechanics" in this country, and his active years are often referred to as "the Timoshenko era" in applied mechanics. At Stanford he assembled an internationally famous faculty that served as a magnet to students and scholars who came from all over the country and the world.

Timoshenko personally directed many doctoral graduates who have themselves become outstanding as teachers, researchers, authors, and practicing engineers. The list of his former pupils reads like a Who's-Who in engineering mechanics. These persons continue to spread his philosophies and uphold his high standards. He admonished his students not to make their dissertations their last scientific effort but to be constantly alert to new developments. His students were always fascinated by his classroom lectures, which were inspiring and long remembered. His subject matter was so much a part of him that his classes were alive with interest, even when the topic was an old and classical one. Because of his intimate knowledge of the history of mechanics, he could teach the classical subjects through the medium of their creators, thus bringing a human dimension to a topic that in lesser hands might have been dull.

It probably was through his widely-used textbooks that Timoshenko had his greatest influence. He was the author of thirteen popular textbooks in the field of mechanics, ranging from books for the first undergraduate course to books for advanced graduate students and research workers. These books have been used by hundreds of thousands of engineering students throughout the United States and the world, and they have been revised and updated through numerous editions. All of them have been published in several languages, and one book alone (Engineering Mechanics) has been translated into over ten languages.

His best-known textbook is Strength of Materials, first published in Russia in 1911 and followed by several later Prussian editions. The first English version of this book was published in the United States in 1930 and achieved tremendous success. It

was followed by two subsequent editions in 1940 and 1955. This same book spawned two offshoots, Elements of Strength of Materials, coauthored with D. H. Young and now in its fifth edition, and Mechanics of Materials, co-authored with J. M. Gere and published in 1972. This sixty-year publication record of a textbook is truly remarkable in the field of engineering and a tribute to the innovativeness of Timoshenko.

Other famous textbooks by Timoshenko include Advanced Dynamics, which was also co-authored with D. H. Young, Theory of Elasticity, Theory of Elastic Stability, Theory of Plates and Shells, Theory of Structures, Applied Elasticity, and History of Strength of Materials. In addition to his textbooks, Timoshenko wrote two other books, Engineering Education in Russia and As I Remember, the latter an autobiography published in 1963.

Stephen Prokofievitch Timoshenko was born in a small village near Kiev, Russia on December 22, 1878. He studied in Russia at the Institute of Engineers of Ways of Communication and subsequently taught at the newly-organized Polytechnic Institute of St. Petersburg. He also did advanced studies in Germany at the Munich Polytechnic Institute and at the University of Göttingen, from which he graduated in 1905. He was a professor at the Polytechnic Institute of Kiev from 1907 to 1911 and at the Polytechnic Institute of St. Petersburg from 1912 to 1917. Political and military events in Russia during and after this period resulted in considerable difficulty for Timoshenko and his family. In 1919 he served in the White Army, but soon was forced to flee Russia, leaving Kiev (where he and his family were living) and traveling through Novorossijsk and Sebastopol, eventually reaching Yugoslavia, where he arrived on March 15, 1920. A short time later he made his way through Austria, Czechoslovakia, and Poland and back to Kiev in an attempt to reach his family. He and his family were on the last refugee freight train to leave Kiev. The trip was fraught with danger, for the Bolshevik Cavalry was in close pursuit. During the first week, the train could travel only sixty miles. However, they eventually reached safety and traveled on to Warsaw, Vienna, and finally back to Yugoslavia. They had lost all their possessions but were in good health and happy to be together. During these adventures Timoshenko was helped on several occasions by former pupils and once was provided much-needed lodging by an admirer who had read one of his books. Years later, Timoshenko remarked that that was the most practical and useful result of all of his writings!

After teaching at the University of Zagreb in Yugoslavia from 1920 to 1922, Timoshenko decided to come to the United States, arriving in Philadelphia on June 22, 1922. He was then forty-three years old. He worked in Philadelphia at the Vibration Specialty Company for about a year and then moved to Pittsburgh to join the Research Laboratories of the Westinghouse Electric Corporation, where he stayed until 1927. Timoshenko had been hoping to return to academic life, and in 1927 he was invited to join the faculty at the University of Michigan, where he taught until 1936. It was during this period that he published some of his most famous textbooks and inaugurated a new era in applied mechanics in this country. In 1936 he was offered a professorship at Stanford, a position which he held until his formal "retirement" in 1944. Actually, he continued teaching and writing at Stanford for another decade. It is a matter of local interest that Stanford University was urged to make Timoshenko an offer in 1925, before he went to the University of Michigan, but the administration felt that a man past the age

of forty-five was a questionable risk. It is somewhat ironic to note that eleven years later, no questions of age were raised!

Timoshenko received many honors and awards in recognition of his outstanding professional accomplishments. He received honorary doctor's degrees from the University of Turin (1960), Zagreb University (1956), University of Bologna (1954), University of Glasgow (1951), München Technische Hochschule (1949), Swiss Federal Institute of Technology, Zurich (1947), University of Michigan (1938), and Lehigh University (1936). He was elected to memberships in the following national academies and societies (dates are the years in which elected): Academia Nazionale dei Lincei, Rome (1948); Royal Society, London (1944); U.S. National Academy of Science (1941); French Academy of Science (1939), American Philosophical Society (1939); Polish Academy of Technical Sciences (1935); Russian Academy of Science (1928); and Ukrainian Academy of Science (1918). In addition, he was a member of the following professional societies: American Society of Mechanical Engineers, Society for Experimental Stress Analysis, American Institute of Aeronautics and Astronautics, American Geophysical Union, American Mathematical Society, American Association for the Advancement of Science, Society of Automotive Engineers, American Society for Engineering Education (Honorary Member), Gesellschaft für Angewandte Mathematik und Mechanik, Verein Deutscher Ingenieure, and Honorary Foreign Member of the Association des Ingénieurs-Docteurs de France.

He was awarded numerous medals during his lifetime, the last of which was the James Ewing Medal awarded by the Institution of Civil Engineers of Great Britain in 1963. Previously, he received the Cresson Medal (1958) and the Levy Medal (1944) from the Franklin Institute, the Traserster Medal (1948) from the Association des Ingénieurs Sortis de l'École de Liège, the James Watt International Medal (1947) from the Institution of Mechanical Engineers of Great Britain, the Grande Médaille (1947) from the Association des Ingénieurs - Docteurs de France, the Lamme Medal (1939) from the American Society for Engineering Education, the Worcester Reed Warner Medal (1935) from the American Society of Mechanical Engineers, the Salow Prize (1915) awarded in Russia, and the Jourawski Medal (1911) from the Institute of Engineers of Ways of Communication.

In 1957 the American Society of Mechanical Engineers established the Timoshenko Medal in his honor, and he was the first recipient of this annual award because "by his invaluable contributions and personal example, he guided a new era in applied mechanics."

On his sixtieth birthday, Timoshenko was honored by the publication of a special volume of twenty-eight papers in applied mechanics dedicated to him. Published by the Macmillan Company in 1938, it was titled "Stephen Timoshenko – 60th Anniversary Volume." Most of his own research papers were reprinted in "The Collected Papers of Stephen P. Timoshenko," a 642-page volume published in 1953 by McGraw-Hill.

Timoshenko was a founder of the Applied Mechanics Division of the American Society of Mechanical Engineers and was influential in starting the "Journal of Applied

Mechanics," published by that Society and today one of the world's leading mechanics journals.

Timoshenko's personal contributions to mechanics include the development of the energy method in problems of structural stability, the theory of lateral vibrations of beams (Timoshenko-beam theory), the concept of the shear center of a beam, the theory of warping and torsion of structural beams, and many other topics from elasticity theory. Much of the work he pioneered is now classical subject matter that is taught as standard topics in engineering courses.

A few years ago Timoshenko donated his medals and his personal library, containing an extensive collection of old and rare books on mechanics, science, and engineering, to Stanford University. A special "Timoshenko Room" houses this collection on the Stanford campus.

A memorial service for Timoshenko was held on June 15, 1972 in the Stanford Memorial Church. Tributes to him were offered by Frederick E. Terman, Vice President and Provost Emeritus and former Dean of Engineering at Stanford; Donovan H. Young, Professor Emeritus of Civil Engineering at Stanford and a well-known co-author with Timoshenko; and Egor P. Popov, Professor of Civil Engineering at the University of California, Berkeley, who was one of Timoshenko's last Ph.D. students and is himself an outstanding author and researcher.

Survivors include his son, Gregory S. Timoshenko, Professor of Electrical Engineering at the University of Connecticut; two daughters, Mrs. Anna Hetzelt, with whom he was living at the time of his death, and Mrs. Marina Goodier, widow of a Stanford professor; a sister-in-law, Mrs. Odette Timoshenko, widow of his brother Vladimir, who was a Professor at the Food Research Institute at Stanford; and also grandchildren, great grandchildren, nieces, and nephews. His ashes were interred at Alta Mesa Cemetery, Palo Alto, next to the grave of his wife, Alexandra, who died in the early 1950s.

With the passing of Timoshenko, a great man and a great era are gone. But both will remain in the hearts and minds of those many persons who were influenced by his teachings, his kind thoughts, and his infinite concern for students.

James M. Gere, Chairman
George Herrmann
William M. Kays
Erastus H. Lee