

# SEM History

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## **THOMAS J. DOLAN SESA PRESIDENT**

**1951-52**

*by C.E. Taylor*

Thomas James Dolan's associations with the SESA began in 1941, before the Society was formally organized, and continued several decades. Early in his career Tom Dolan was an active and talented photoelastician who participated in several of the *Eastern Semi-Annual Photoelastic Conferences*, the parent organization of the Society for Experimental Stress Analysis. In fact, he was a member of the Executive Committee of the *Seventeenth Eastern Semi-Annual Photoelastic Conference* in 1943 when the group decided to broaden its scope and become the SESA. Thus Tom was active in SEM/SESA before its formal beginnings. However, when SESA was born, he was Captain Thomas J. Dolan in the U.S. Army (1942-45). Soon after returning to civilian life he resumed his activities with the new society and was a co-author (with W. M. Murray) of the chapter on photoelasticity in the SESA's *Handbook of Experimental Stress Analysis*, edited by M. Hetenyi. Tom Dolan remained heavily involved in the affairs of the SESA and in 1951-52 he served as its ninth President. In 1969 he presented the William. M. Murray Lecture and in 1975 Tom was made a Fellow and an Honorary Member. He was one of the featured speakers at the 40th Anniversary Celebration of the SESA in Cleveland, OH in 1983. For several years he attended national SESA meetings and was a frequent speaker at local SESA section meetings. As my department head, Tom provided moral support and very generously furnished much appreciated financial support for my travels when I served in the various offices of the Society.

An excellent student, Tom Dolan graduated in Civil Engineering at the University of Illinois with highest honors in 1929. His name was placed on the University's prestigious Bronze Tablet signifying that he graduated in the top three per cent of his class. Tom worked for a short time after graduation for the Chicago Bridge and Iron Co. then returned to Urbana to pursue graduate work and earn a M.S. in Civil Engineering in 1932. Except for the brief period during World War II, mentioned earlier, Tom Dolan spent the remainder of his career at the University of Illinois.

In 1929 Tom married Virginia B. Fisher and they had two children, a daughter Cynthia and a son Thomas J. Dolan, Jr. Cynthia graduated from University of Illinois and married Robert Gabrielli, another University of Illinois graduate, who was a career army officer with a second career in financial planning in Springfield, VA . They have three children including Michael who graduated from the University of Illinois. Tom Jr., earned a B.S. degree in Engineering Mechanics plus a M.S. and a Ph.D. in Nuclear

Engineering all at the University of Illinois. Tom (Jr.) is married with three children and is currently a physicist at the United Nations International Atomic Energy Agency in Vienna, Austria. Tom (Sr.) was especially proud of the fact that his son and grandson followed in his footsteps as honor students in engineering at the University of Illinois. Tom Jr.'s name was added to the University's Bronze Tablet.

As a young faculty member Tom (Sr.) taught all of the basic mechanics courses, including vibrations and experimental stress analysis. He conducted research investigations on hydraulics, structures, concrete, and fatigue of metals, as well as photoelasticity. When on active duty in the U.S. Army, he was stationed at Watertown Arsenal in Massachusetts and was in charge of gun tube manufacturing and of all subcontracting at Watertown Arsenal. When Tom returned to the University of Illinois after World War II his interest turned to fatigue and fracture of metals. During that period, he and Professor Herbert T. Corten showed that Miner's rule, a commonly-used simple linear-accumulation calculation for fatigue damage, didn't work if low-amplitude and high-amplitude block loadings were arranged in various ways. They then came up with a way to take into account a sequence effect that depends on the most recently recorded maximum stress occurring during the fatigue loading of a given part of a component. They presented their results at a joint conference of the British Institute of Mechanical Engineers and ASME. From then on, the Dolan-Corten Theory was widely referenced and used.

In 1952 Professor F.B. Seely stepped down as the Head of the Department of Theoretical and Applied Mechanics and Tom became the new head. During his 18 years in that position the TAM Department grew phenomenally in size and stature. I can testify to the fact that he was an effective, yet kind and considerate Head. He often said that he thought the best form of governance for a university department was a "benevolent dictatorship." He was benevolent but was certainly not a dictator - Tom preferred to be "one of the boys." Years later he said that one of his big disappointments was being made head of the department. He had been very happy as a teacher and researcher and would rather have continued as a professor. In talking about the headship, Tom was quoted in a department newsletter as saying, "Actually it wasn't too much work for the first couple of years. It was straightforward, I had responsibility and authority. If I wanted to hire you or promote you, I just did it." But as Dolan's tenure continued things changed and he had to hire a business manager, so he continued by saying, "Now it takes a seven-part form plus recommendation letters to hire a part-time person for a month." Clearly he did not enjoy the paper game.

In the last half of his career Tom became interested and increasingly involved in forensic studies of accidents or structural failures. He enjoyed sleuthing and was very good at it. Tom was much in demand as an expert witness in high stakes court battles where material behavior was a crucial factor in the contested event. He served as a consultant on an intermittent or long-term basis to: Rocketdyne, General Motors Corporation, Caterpillar Tractor Company, General Electric Company, A. O. Smith Corporation, John Deere and Company, and Bendix Aviation. He was also a Member of the Board of Directors of Packer Engineering Associates.

Tom Dolan always remained lean and physically fit. I remember him as an avid golfer but he occasionally participated in team sports. Once while Tom was the Department Head one faculty member tried to organize a team for the intramural volleyball league. A sign-up sheet was placed on the department bulletin board and after a couple of days only three or four names had been added. Then Tom signed on and within hours the whole sign-up sheet was full. He was in his mid-fifties then but regularly attended our volleyball sessions. Once a teammate's (named Ed Byars, then a Graduate student) elbow hit the point of Tom's chin and knocked him cold. After a few anxious seconds, Tom came to with a big smile on his face. The game resumed and nothing more was said about it. I had heard that Tom was on the University of Illinois wrestling team and wrote to his daughter for confirmation. Cynthia wrote back saying: "Dad was manager of the wrestling team - I never heard that he actually did any wrestling. I also recall that in his youth Dad played a lot of tennis. He cited the then-prevailing wisdom that one did not play tennis after the age 40 - after W.W.III! (or else he was frustrated with it!) I think that is when he took up golf - and he really loved that."

Cynthia continued, "Dad, as many engineers, loved to putter in his basement workshop. In the 1970's he took up woodworking and made many lovely pieces for family and friends: candlesticks, bowls, salt & pepper sets, trays, vases, etc. He amassed some great electric tools (saws, lathe) - none of which we were able to remove from the basement (too heavy) before they sold the house and moved to Windsor of Savoy! My brother's younger son, Dan (a doctor in Chicago) is following that woodworking tradition avidly - nice memory."

In addition to the SESA honors mentioned earlier, Tom Dolan was honored by other societies. From ASTM he received the R.L. Templin Award in 1952 and the C.B. Dudley Medal in 1954 for outstanding papers on the development of new and useful methods of testing and for meritorious research on engineering materials. In 1974 the University of Illinois College of Engineering awarded him the Alumni Honor Award for distinguished service in Engineering. In 1984 the ASME named him as the recipient of the Nadai Award for his "outstanding and continuing contributions to the advancement of knowledge of metal fatigue and failure analysis, and for leadership in developing engineering procedures and standards to assure safe and reliable products, machines and structures." Tom was listed in *Who's Who in America* and *Who's Who in Engineering*.

Professor Dolan served as Vice President and Member of the Executive Committee of ASME, and on the Board of Directors of ASTM.. He also served on the U.S. National Committee on Theoretical and Applied Mechanics. In addition, Tom was a member of ASEE, Sigma Xi, Tau Beta Pi, Chi Epsilon, and Theta Tau, and was a Registered Professional Engineer in the State of Illinois.

Tom Dolan served the SESA/SEM well in many ways for many years. He was an excellent President and his congenial manner and wise counsel were important in keeping the Friendly Society friendly and healthy. He was my mentor early in my career and was a good friend for nearly a half century. Tom died on January 10, 1996 at the

age of 89 and was survived by his wife, two children, seven grandchildren, and six great grandchildren. Virginia Fisher Dolan was a gracious and caring First Lady of the TAM Department for twenty-one years. My wife and I remember her as an energetic, fun-loving friend. Virginia died September 15, 1997 at the age of 89. They are both fondly remembered by many.