

SEM History

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A TRIBUTE TO DR. DANIEL C. DRUCKER 1918 - 2001

SESA President 1960-61

Dan was a highly esteemed member of SESA/SEM and the recipient of more honors and awards than any other member in the history of SEM. His activity with the Society began with the Eastern Photoelastic Conferences which later became the SESA. For reasons which he couldn't remember he did not attend the first meeting of the new society, but soon joined it and was very active for many years. Dan was a member of the Executive Committee when the momentous decision was made for the Society to hire a headquarters staff and to initiate the monthly magazine *Experimental Mechanics*. Later he was the President when the new mode was made operational, and there were many difficult growing pains during the transition. I was on the Executive Committee at that time and got my first glimpse of his extraordinary ability to settle the sensitive problems without hurting anyone's feelings. Dan was the recipient of the Society's two highest honors, the Murray Lectureship and Honorary Member. He also received the M. M. Frocht Award. Dan continued his association with SEM, and in recent years was a speaker at the SEM 50th Anniversary Celebration, and served as a member of the SEM Educational Foundation and of the International Advisory Board for Experimental Mechanics.

Dan Drucker was born in New York City and started his engineering career as a student at Columbia University. His ambition at that time was to design bridges. While still an undergraduate at Columbia he met a young instructor named Raymond D. Mindlin (later a SESA Founding Member, President, and Honorary Member) who told Dan that "he *would* pursue a Ph.D. degree and he *would* write a thesis on photoelasticity". Dan complied, and received his doctorate in 1940. It was during his student days that Dan met a young lady named Ann Bodin. They *eloped* and were married in 1939.

He taught at Cornell University from 1940 to 1943 before joining the Armour Research Foundation. After serving in the U.S. Army Air Corps, he went back to the Illinois Institute of Technology for a short time before he went to Brown University in 1947. During his tenure at Brown he did much of his pioneering work on plasticity. Dr. Drucker joined the University of Illinois in 1968 as Dean of Engineering. During his more than 15 years there the UI College of Engineering was consistently ranked among the best five in the nation. Although known for insistence upon technical excellence, his college was also recognized for its total commitment to equal opportunity for all. He left Illinois in 1984 to become a graduate research professor at the University of Florida, from which he retired in 1994.

Dan was known throughout the world for contributions to the theory of plasticity and its application to analysis and design in metal structures. He introduced the concept of material stability, now known as "Drucker's Stability Postulate", which provided a unified approach for the derivation of stress-strain relations for plastic behavior of metals. His theorems led directly to limit design; a technique to predict the load carrying capacity of engineering structures. Dr. Drucker also made lasting contributions to the field of photoelasticity. His 1940 paper has become a classic and "Drucker's Oblique Incidence Method" is widely used in university and industrial photoelastic laboratories.

Few people have served the engineering profession with such dedication and distinction as has Dan Drucker. In addition to the SESA, he was a president of ASME, ASEE, the American Academy of Mechanics, the International Union of Theoretical and Applied Mechanics (being only the second American ever to serve in that office), and other organizations.

The American Society of Mechanical Engineers established the ASME Daniel C. Drucker Medal to honor Professor Drucker for his contributions to applied mechanics in research, education, and leadership. The new medal is bestowed on individuals in recognition of sustained, outstanding contributions to applied mechanics and mechanical engineering through research, teaching, and /or service to the community. Dr. Drucker was the first recipient of the medal which was presented at an 80th birthday luncheon honoring Dan during the Thirteenth U.S. National Congress of Applied Mechanics in Gainesville, FL, in June 1998. ASME also honored Dan with the Timoshenko Medal, the Thurston Lectureship, the ASME Medal, and Honorary Membership. For twelve years he was the editor of the Journal of Applied Mechanics.

ASEE conferred upon Dan the Lamme Medal, the Distinguished Educator Award of the Mechanics Division, he was a Founding Fellow, and elected to ASEE Hall of Fame. ASCE presented to him the von Karman Medal; The University of Liege gave him the Gustav Trasenter Medal; Columbia University conferred upon him the Egleston Medal and the Illig Medal; from the Society of Engineering Sciences he received the first William Prager Medal; the Founder Engineering Societies gave him the John Fritz Medal; he was the 1966 Marburg Lecturer for ASTM; he was awarded the Prof. Modesto Panetti and Prof. Carlo Ferrari International Prize and Gold Medal. Dr. Drucker had honorary doctorates from Lehigh, Technion, Brown, Northwestern, and the University of Illinois at Urbana-Champaign. After Dan's death, his daughter Mady found among his mementos a "Medal for Getting the Most Medals" which someone had jokingly presented to him.

In 1988 Dr. Drucker received the National Medal of Science. He was a member of the National Academy of Engineering and of the American Academy of Arts and Sciences, and was a Foreign Member of the Polish Academy of Sciences. He was listed in the national and international editions of Who's Who.

An articulate speaker who consistently gave stimulating and informative talks, Dr. Drucker was frequently invited to give keynote or other major addresses at engineering

meetings. He had a reputation as an incisive thinker, and his advice was eagerly sought and generously given at the university, state and national level. A list of such participation is too long to be given here. but recent examples include: NAS Committee on Human Rights, NRC Engineering Research Board, National Science Board and the chairmanship of the NAE Committee on membership Policy.

Dan and the 20 year old girl with whom he eloped lived for more than sixty-one years as a very devoted and loving couple. They had a son, Dr. David Drucker now in Utica, NY, and a daughter, Mrs. Mady Drucker Upham now in Rockport, Mass.; and four grandchildren. My wife Nikki and I moved to Florida in 1981, but when the Druckers became our neighbors in Gainesville three years later our social life increased by a factor of ten. Ann was a very generous person with a great sense of humor. She was interested in everything and we went to countless plays and musical performances together. Typically we would have dinner, attend the play, then end up at one our houses for desert. For the Taylors those years were our Camelot. In 1994 Ann suffered a severe stroke which confined her to a wheelchair. Dan stayed near always. Although he had traveled extensively all of his professional life, he never left Gainesville after her stroke. Ann Drucker died on December 30, 2000.

I met Dan during my first SESA meeting in 1949. At that time I had just started working toward a Ph.D. at the University of Illinois and intended to write a thesis on three-dimensional photoelasticity. Tom Dolan, who was my advisor, also attended that meeting and made sure that I met the important SESA members. When he saw Ray Mindlin and Dan Drucker standing across the room, he said to me, "Come over here, I want you to meet these two. They think things through pretty well before they speak, and are usually right". That was my introduction to Dan Drucker, and Tom was right. After that I started to see Dan regularly at meetings and he always greeted me with a big smile and a handshake. He had just written the chapter on three-dimensional photoelasticity in the *Handbook of Experimental Stress Analysis*, so I often talked with him about my proposed thesis. He was easy to talk with and always very helpful. In a sense he was a mentor for me even while he was still at Brown University. That happy relationship continued while we both worked through the various SESA offices, and while he was a very busy dean at the University of Illinois. He always made time to talk with me about technical subjects or SESA business.

When Dan came to Florida he immediately joined our department's "lunch bunch" which met every school day at noon. At various times that included Knox Millsaps, Larry Malvern, Ray Bisplinghoff, Hans von Ohain, Chia-Shun (Gus) Yih, plus Dan Drucker and me. What a wonderful group of colleagues! I felt truly blessed, but now all of these special friends have passed away and they are sorely missed. Up until the last month of his life, Dan and I still tried to have lunch three days a week. Those were happy occasions, even though we both realized that the inevitable was sneaking up on him. We didn't dwell on that and found lots of things to laugh about. In all of the thousands of hours we spent together, I never heard him utter a single swear word. He had a great sense of humor, but he never told a joke (off-color or otherwise), and he never spread gossip. If he ever had an unclean thought, he certainly didn't share it with me. I have

never met a more honest or pure person. In other words, he was the kind of person that we all try to be.

Several people who knew how special Dan was to me, sent e-mail messages after Dan's death from leukemia on September 1, 2001. Their words are much more eloquent than mine so I would like to include excerpts here. Philip Hodge wrote, "...I admired Dan, the scientist-engineer. But I also admired and liked Dan, the person. He was one of the most informed, the most fair, the most tactful, the most organized people I have ever known. I have watched him chair meetings of the ASME Council and of the IUTAM General Assembly - and it was a joy to see how he managed to make those highly autocratic bodies more democratic - and all without hurting anyone's feelings..."

Karl Pister wrote this to several colleagues, "... I know this [bad news] hits all of us hard. We have each had the privilege of knowing and working with Dan in some capacity. He was both a role model and a mentor for me, even at a distance, and he was invaluable as a member of my advisory committee while I was dean at Berkeley. What a splendid legacy he has left us, what an impact he had on so much - not just applied mechanics. We were fortunate to have known and worked with such a man. With sadness filled with respect, Karl."

Dick Christensen wrote, "...I feel about the same way that you must. He really was very special. I know for sure the succeeding generations in our field don't have any more like him. I had been emailing with him and did so the last time 4 days before his death. At least I feel a little good about that..."

Ben Freund said, "...I am deeply sorry to learn that we have lost one of the brightest stars our field has known in my time. It happens that I have recently come back from this year's IUTAM Bureau meeting in Warsaw. While participating, I found myself thinking 'How would Dan handle this problem?' several times when sticky issues came up".

Mike Fourney added, "...I was fortunate to send [Dan] an email and to receive a reply before he passed . . .He was certainly a great guy and I know that you will miss him, as will we all."

Of course, the Drucker family received letters of condolence from all over the world. Mady was kind enough to give me a copy of most of those letters. The common thread that went through all of those letters was that Dan was highly respected as an engineering leader, but that he was greatly admired as a person. Everyone mentioned that his kindness and help had influenced their careers and their lives. What an impact he made and what a legacy he left!

— C. E. Taylor, SEM Historian

