

A tribute to
Arthur P. Boresi (1924–2021)

Arthur Peter “Art” Boresi, professor emeritus of civil and architectural engineering at the University of Wyoming, Laramie, and formerly of theoretical and applied mechanics at the University of Illinois at Urbana-Champaign, died February 15, 2021, at age 96 at Laramie.

Formative years

Art was born August 27, 1924, in Toluca, Illinois, to Italian immigrants John Petro and Eva Catherine (Grotti) Boresi. John Boresi had come to the U.S. to work in the coal mines. Eva was an excellent cook and prepared homemade ravioli and tortellini for Capponi’s restaurant in Toluca.

Art attended St. Ann’s grade school at Toluca (1930–1938) and Toluca High School (1938–1942). In 1942, after a brief stint as an extra gang worker on the Santa Fe Railroad in Toluca, he entered the University of Illinois at Urbana-Champaign (UIUC), intent on earning a bachelor’s degree in electrical engineering.

World War II broke out in 1941, however, and Art’s undergraduate studies were cut short after one semester. He served in the U.S. Army from February 1943 to September 1946, first in the Army Air Force, studying meteorology at Kenyon College, Gambier, Ohio (February 1943 to March 1944), then as a private in engineering basic training at Fort Belvoir, Virginia (April–July 1944). He then entered Officer Candidate School at Fort Belvoir, completing a heavy equipment school course (March 1945) and serving as a 2nd lieutenant in the engineering battalion at Fort Lewis, Washington (March–April 1945). From May to September 1945, he was stationed in Luzon, Philippine Islands. He completed his military duty as a 1st lieutenant, combat engineers division, teaching general engineering subjects (mapping, bridge construction, heavy equipment). Art was proud of his military service and always held in high esteem the service and sacrifices made by members of the U.S. armed forces.



Arthur P. Boresi, 1986

Upon his discharge from the Army in September 1946, Art resumed his studies in electrical engineering at UIUC, completing the requirements for his bachelor’s degree in August 1948.

Graduate studies

For his graduate work, Art switched from electrical engineering to mechanics. He entered the master’s program in Theoretical and Applied Mechanics (TAM) at UIUC in September 1948. He first took courses from TAM professors Nils Otto Myklestad in vibrations and James Ohrea “J.O.” Smith in advanced strength of materials. Additional courses in applied mathematics were taken with Ray G. Langebartel in the mathematics department. Art’s master’s thesis in dynamics,

“Investigation of the coefficient of irregularity considering the flexibility of the system,” was completed in August 1949 under the guidance of Nils Myklestad.

Art continued taking graduate courses in theory of elasticity under Myklestad and was intending to study under him for his doctorate in TAM. However, in 1952, Myklestad left UIUC for North American Aviation in Los Angeles, California. Art had already passed his doctoral prelims and needed to find another advisor.

As it happened, Art had also taken two graduate fluid mechanics courses from the legendary TAM professor Henry Louis “Hank” Langhaar, who graciously took Art on as a doctoral student. Art’s doctoral thesis, “A refinement of the theory of buckling of rings under uniform pressure,” was completed in June 1953. The thesis formed the basis of Art’s first published article (*Journal of Applied Mechanics* **22**(1), 95–102) and set the course for many more papers that followed.

Career at the University of Illinois at Urbana-Champaign

Art gained considerable teaching experience in mechanics as a teaching assistant while working on his master’s degree, and as an instructor while working on his doctoral degree. Upon earning his doctorate in TAM in September 1953, Art began a distinguished 26-year career as a tenure-track faculty member at UIUC, starting as assistant professor. He was promoted to associate professor in 1957 and to full professor in 1959, the position he held until his retirement in 1979. During that time, he offered courses in advanced strength of materials, elasticity, energy methods, theory of shells, thermomechanics, nuclear engineering, stability, dimensional analysis, and continuum mechanics.

More than 20 students earned their doctorates in TAM under Art’s guidance. Many of these graduates went on to prominent careers in academia and industry. From 1962 to 1979, Art also held a joint appointment in Nuclear Engineering. Students in that department benefitted from Art’s dissertation advising as well.

Doctor of Philosophy

1961	Wilson, Paul E.	TAM	The influence of transverse shear on the large deflection of elastic flat plates
1962	Kemp, Emory L.	TAM	An analytical and experimental study of torsion in reinforced concrete beams
1963	Cook, Robert D.	TAM	A mechanics analysis of coupled tube sheets
1963	Bower, John E., Jr.	TAM	Stress concentration around cutouts in shells of revolution
1963	Hill, James L.	TAM	On the axisymmetric elasticity problem of the spherical ring
1963	Verette, Ralph M.	TAM	An analytical and experimental investigation of shallow hyperbolic paraboloid shells subjected to concentrated load
1964	Jones, Robert M.	TAM	Post-buckling configurations of axially loaded circular cylindrical shells
1964	Sliter, George E.	TAM	A contact problem for an elastic quasi-rectangular region
1964	Nikolai, Robert J.	TAM	On a theory for axisymmetric elastic shells of moderate thickness
1965	Fretwell, C. Cecil	TAM	A Papkovitch–Neuber solution for the stresses and displacements in an infinitely long hollow circular cylinder
1968	Vigneron, Frank R.	TAM	Configuration instability and despin of crossed-dipole satellites due to the earth’s gravity field
1969	Kanazawa, Richard M.	NucE	Hydroelastic vibration of rods in parallel flow



Advisory committee in Theoretical and Applied Mechanics, UIUC, circa 1960. Pictured clockwise, starting at the center in front, are Charles E. Taylor; Paul G. Jones; Henry L. Langhaar, doctoral thesis advisor for Taylor and Boresi; Cletus E. Bowman; George M. Sinclair; Arthur P. Boresi; and department head Thomas J. Dolan.

1969	Pickel, Thomas W.	TAM	Flow criteria and constitutive relations for the numerical analysis of plane stress problems with creep
1969	Stoneking, Jerry E.	TAM	A theory for free vibration of anisotropic shells of revolution
1971	Branca, Thomas R.	TAM	Creep of a uniaxial metal matrix composite subjected to axial and normal lateral loads
1972	Ford, John L.	TAM	A method for material characterization employing the finite element technique with application to holography
1974	Holze, Gordon H.	TAM	Free vibrational analysis of structural systems using the method of substructuring
1977	Jerath, Sukhvarsh	TAM	The analysis of covered cylindrical storage bins subjected to unsymmetrical loading by shell bending theory
1977	Liao, Yun Kuo	TAM	Large deflections and stability of circular rings and arches
1977	Sharma, Sushil K.	TAM	Finite element weighted residual methods for static analysis of axisymmetric shells

Art and his colleagues and students published widely in such journals as *Journal of the Engineering Mechanics Division (ASCE)*, *Journal of the Structural Division (ASCE)*, *Journal of Applied Mechanics (ASME)*, *American Institute of Aeronautics and Astronautics Journal*, *Journal of Nuclear Structural Engineering*, *Nuclear Engineering and Design*, and *Experimental Mechanics*. Many papers were also presented at conferences throughout the U.S. and abroad.

Perhaps Boresi is best known worldwide, however, for the books he wrote or coauthored. His first book, coauthored with his advisor Hank Langhaar, was a two-volume set entitled *Engineering Mechanics—Statics and Dynamics* (McGraw-Hill, 1959). This treatise was the first on the subject to use vector analysis throughout, and it set the standard for later books by other authors. A later edition of the book, coauthored with Richard J. Schmidt, appeared in 2000.

Art's signature book, *Elasticity in Engineering Mechanics*, was first published in 1965 by Prentice-Hall. Later editions of this popular text appeared in 1974 (with Paul P. Lynn), 1999 (with Ken P. Chong), and 2010 (with Ken P. Chong and James D. Lee).

In 1978, Art and his TAM colleague Omar Marion Sidebottom published a revision of the classic text by former TAM professors Fred B. Seely and James O. Smith, *Advanced Mechanics*



Art and Jean Boresi at the retirement dinner for Prof. Fred B. Seely, UIUC, 1952

of Materials (John Wiley & Sons). The book had been first published in 1932 by Fred B. Seely, who served as TAM's department head from 1934 to 1952. It remains popular today, the most recent revision being published by Boresi and Schmidt (2003).

Standards and Technology), Argonne National Laboratory, Allison Division of GM, Marley Company, Chicago Bridge & Iron, Industrial Chemicals, the Atomic Energy Commission, and the U.S. Army.

Art consulted widely on topics in applied mechanics, particularly on shell theory and system dynamics. Companies and agencies that he served included North American Aviation, the National Bureau of Standards (now the National Institute of

He also held distinguished visiting appointments at Clarkson College of Technology (now Clarkson University), 1968–1969, and at the Naval Postgraduate School, 1979 and 1986. Art was also recognized for his engineering contributions by elevation to the grade of fellow in the American Society of Mechanical Engineers, the American Society of Civil Engineers, and the American Academy of Mechanics.

In 1978, Art organized a conference at UIUC in honor of his mentor and longtime colleague Hank Langhaar, who retired that year. In 1979, having been associated with UIUC for 37 years as either a student or faculty member, Art also retired and moved with his wife Jean to Laramie, Wyoming, where he started a second chapter in his long academic service.

Career at the University of Wyoming

Art joined the civil and architectural engineering faculty at the University of Wyoming in 1980 and by 1981 had been named head of the department. He held this position for 13 years, retiring from academia again in 1994.

As department head at Wyoming, Art attracted several outstanding new faculty members. He was also effective in increasing the graduate student enrolment and in overseeing a record increase in departmental research funding. "I worked very closely with him for 11 years," Prof. James L. Smith wrote in 1994, "and have enjoyed the benefits of his many contributions to the department. . . . Without a doubt, Art is a true friend, one whose first concern is always for people, the students, staff, and faculty."

A major event co-organized by Art and Prof. Ken P. Chong in his department during Art's tenure there was the 5th ASCE–EMD specialty conference on Engineering Mechanics in Civil

Engineering held at Laramie in 1984. The event attracted about 500 engineers and scientists from all parts of the world. Participants interacted with each other and benefitted from keynote lectures by such eminent scholars as Paul S. Symonds, H. H. E. Leipholtz, Ted Y. Wu, and Eric Reissner.



Art and Jean Boresi, 1993

In 1993, the year before he retired from the University of Wyoming, Art received the Archie Higdon Distinguished Educator Award of the American Society for Engineering Education for outstanding contributions to engineering mechanics education. He was also presented with the University of Wyoming's Tau Beta Pi award for outstanding graduate research and teaching.

Some personal details

Shortly after his discharge from the U.S. Army in September 1946, Art met Clara Jean Gordon, a native of Urbana, Illinois. She had returned to her hometown after working briefly in Washington, D.C., where she was staying with her older sister Mary. Jean was walking along Wright Street in Campustown when Art saw her for the first time. They were married in December 1946 after a three-month courtship.

Art and Jean had three daughters. All are University of Illinois graduates. The oldest, Jennifer, moved to Carmel, California. She and her husband William Hill had two children, Melissa and Michael. Jennifer died in 2006, predeceasing both Art and Jean. Annette and her husband Bradley Pueschel reside in Peoria, Illinois. They have two children, Diane and Eric. The youngest daughter, Nancy, and her husband Ed Broderick live in Carmel, California. Nancy is an IT technical specialist at LanguageLine Solutions, a translation services company with headquarters in Monterey, California.

After Art and Jean moved to Wyoming in 1979, they began building a vacation cabin on Douglas Creek in the Medicine Bow mountains just west of Laramie. For more than 20 years, the secluded cabin, creek, and surrounding woods became a favorite destination for family members and some of Art's close friends from the University of Wyoming. Sadly, in the winter of 2002, while Art was leading a convoy of snowmobilers looking for Christmas trees in the woods, another snowmobiler rounded a bend at high speed and hit Art's snowmobile head-on, ejecting Art from his vehicle. The accident disabled Art and confined him to a wheelchair for the rest of his life. In his earlier days, Art had been a competitive handball player, and always had a good sense of humor. It is a tribute to Art's physical and mental fitness that he maintained a positive outlook on life for nearly 20 years after the accident, corresponding with



Jean "Jean2" Shaw with Art Boresi, 2007. Art is holding Jean2's dog "Boo."

colleagues by email. Jean “Jean2” Shaw became Art’s primary caregiver and assisted both Art and Jean for the rest of their lives.

Art’s cherished wife Jean died in 2012. They had been married 65 years. A memorial fund in her honor was established by the University of Wyoming at that time. A separate scholarship fund in Art and Jean’s names had already been established in 1994 when Art retired. Contributions to that fund at the University of Wyoming Foundation (<http://uw.uwyo.edu/boresi>) are welcome.

Closure

Art was a respected scholar and a gentleman, a giant in mechanics and a role model as well as a great mentor for young faculty members. He was also a devoted husband and father. He will be missed by many.

Acknowledgments

The authors of this tribute would like to thank Art’s daughters, especially Nancy Broderick, for their insights into Art’s family.

March 16, 2021

James W. Phillips, Ph.D., P.E.
Professor emeritus of Mechanical Science and Engineering
University of Illinois at Urbana-Champaign

Ken P. Chong, Ph.D., P.E.
Research professor of Mechanical and Aerospace Engineering
George Washington University

Richard J. Schmidt, Ph.D., P.E.
Professor emeritus of Civil and Architectural Engineering
University of Wyoming