



William B. Streett

January 27, 1932 – February 5, 2024

William B. (“Bill”) Streett, Cornell University professor emeritus in the School of Chemical & Biomolecular Engineering and former Cornell Dean of Engineering, passed away at his home in Cincinnati, Ohio. Bill will be remembered as a world leader in experimental studies of the thermodynamic behavior of fluid and solid mixtures at very high pressures, and a pioneer in the development of the new field of molecular simulation methods to investigate such mixtures in the 1960’s.

Bill Streett had two very successful careers, the first at the U.S. Military Academy at West Point and the second at Cornell University. In 1951, he entered West Point as a plebe, graduating with the B.S. degree in 1955, ranking 3rd in his class of 470. He excelled in marksmanship, winning the infantry Weapons Trophy, and becoming Vice President of the Honor Committee. He earned ‘stars’ for academic excellence in all four years as a cadet.

The day after his graduation, Bill married his high school girlfriend, Jackie L. Heard at U.S. Military Academy West Point. Between 1956 and 1961, they had four children, Robert, David, Kathleen (Cornell MBA, ’87) and Michael ’84.

Following graduation, Bill was commissioned in the Armor Branch, completing parachute training and the Armor Officer Basic Training Course at Fort Knox. He joined the 3rd Armored Division in 1956 and moved to Germany for two years, where he served as a tank platoon leader with the rank of lieutenant. Returning to West Point in 1959, he accepted a teaching position in the Department of Earth, Space and Graphic Sciences, later becoming associate professor, then professor. He taught astronomy, astronautics and geography. This position came with two years of graduate study at the University of Michigan at Ann Arbor, where he carried out research sponsored by NASA on the solubility of helium in liquid hydrogen [1], to investigate hydrogen’s suitability as a rocket fuel. He received the Ph.D. in mechanical engineering in 1963.

In 1966, he was awarded a NATO Research Fellowship in Chemistry to spend a year at Oxford University. His host was Lionel A.K. Staveley, who was internationally known for his work on

the thermodynamics and phase behavior of cryogenic liquids. This proved to be very complementary to Streett's doctoral research, involving difficult measurements at low temperatures and high pressures. This visit led to a long-standing collaboration with Staveley and some of his former students, most notably, Jorge C.G. Calado of Instituto Superior Técnico in Lisbon and Manuel Nunes da Ponte at the Universidad Nova de Lisboa.

Soon after his return from Oxford, the U.S. Military Academy, impressed by his growing international reputation in scientific research, appointed Bill as the first assistant dean for research at West Point. They proposed the establishment of a Science Research Laboratory (SRL) at West Point, with Bill as the founding director. The SRL officially opened in 1967, and, over the ensuing nine years, their research led to more than 30 scientific publications, of which 10 were authored by Bill alone. The laboratory did not have graduate students, postdocs or technicians to carry out the research, as in research universities. Occasionally, an officer with interest in science was transferred to the SRL for a limited period but, for the most part, Streett was a 'one-man band,' creating ideas, designing and building apparatus, carrying out and interpreting the measurements.

In 1974, Bill was awarded a Guggenheim Fellowship to conduct research at Oxford. His host was again Lionel Staveley (Inorganic Chemistry Laboratory) and also John S. Rowlinson, a theoretical chemist in the Physical Chemistry Laboratory. By now, Bill had developed a strong interest in molecular simulation, in which the exact equations of statistical mechanics were solved numerically, without further approximation, on an electronic computer, an interest shared by Rowlinson. With Staveley, he continued his work on high-pressure thermodynamics of liquids, leading to papers that remain the best data on mixtures of molecularly simple liquids. With Dominic Tildesley, a D.Phil. student in the group of Rowlinson, he worked on improvements to the molecular simulation methodology for liquids.

In 1978, Bill retired from the U.S. Army with the rank of colonel, and joined the faculty of Cornell in the School of Chemical Engineering. There were numerous Cornell researchers with interests close to or complementary to Bill's, including P. Clancy, D.J. Evans, K.E. Gubbins, A.Z. Panagiotopoulos in Chemical Engineering, as well as N. Ashcroft, M.E. Fisher, B. Widom, K. Wilson and others in the College of Arts and Sciences. The school had the benefit of quite advanced computing facilities for the time, including a PDP 1170 computer and array processors (shared with Ken Wilson in Physics) dedicated to molecular simulation work. Together with the availability of talented graduate students and postdocs, Bill was able to quickly re-build his high-pressure laboratory and expand his research program in thermodynamics and simulation. This work led to approximately 70 scientific publications over the course of his Cornell career.

At Cornell, his presence attracted several distinguished visitors from overseas. He continued his collaborations with researchers at Oxford and Lisbon. His first postdoc was D.J. Tildesley from Oxford, continuing his work on the simulation of liquids, and he worked with D.J. Evans (also from Oxford), on extensions of molecular dynamics methods. Jorge Calado and Manuel Nunes da Ponte from Lisbon were frequent visitors and collaborators. Ulrich Franck from Karlsruhe, distinguished for his fine high-pressure studies of pure substances, visited for almost a year.

Bill's work on the phase behavior of mixtures at high pressure was highly relevant to chemical

engineers because of the need to design high-pressure processing equipment for industry. However, it was also of interest in other fields, including planetary science and in deep-sea diving. The main components of the high-pressure atmospheres of Jupiter and Saturn are hydrogen and helium, and Bill published several papers on the phase behavior of such mixtures in astrophysical journals. One of these papers (*Icarus*, 1971), with his West Point colleague, Harry Ringermacher and George Veronis, a planetary scientist at Yale, proposed a new hypothesis to explain the cause of Jupiter's Great Red Spot. Streett's experiments suggested that the Red Spot is a hydrogen-rich solid layer floating in a fluid mixture of hydrogen and helium. They were able to show that their hypothesis was consistent with the observed wanderings of the Red Spot over time. Their paper made Time magazine (Science Section, July 5, 1971).

In 1982, Dean Tom Everhart became aware of Bill's leadership abilities, appointing him associate dean for graduate study and research in the College of Engineering. In 1984, Bill became the acting dean while a search took place. In 1985, he was appointed the Joseph Silbert Dean of Engineering, and served in this position until 1993. As Dean, he emphasized improving the undergraduate experience, and national recognition of College faculty. At the time, the undergraduate engineering curriculum heavily emphasized technical courses, leaving little space for other educational areas, particularly humanities and communication. The introductory calculus course, taught in large lectures, was a barrier to students entering engineering. Bill spearheaded changing the curriculum to allow more non-engineering courses, encouraging students to include humanities courses. A program in oral and written communication was introduced, and the calculus course was taught in small classes. Student retention improved as a result. He also put a lot of effort into improving the engineering facilities. Notable among these was the addition of Rhodes Hall, which housed space for electrical and computer engineering, as well as the Theory Center.

Bill established new programs to help women succeed in engineering. He was ahead of his time in welcoming women and other under-represented groups to engineering and remained a bulwark against sexism and racism and an advocate for safety and mental health on campus. This resulted in an increase in the enrolment of women in the college to 25% (the national average was 17% at that time) and increased the number of tenured women faculty from 1 to 14. He also organized the nomination of deserving faculty for election to the National Academy of Engineering. This resulted in the election of 19 college faculty to the NAE during his deanship, a remarkable number. Such election is widely regarded as the capstone award in engineering.

He retired in 1995 to care for Jackie, his ailing wife. After she passed away, he co-founded a company, with Bill as president, based on non-destructive evaluation of concrete using "Impact-Echo" technology developed at Cornell by Dr. Mary Sansalone (civil engineering). In 1999, he and Mary were married. Together, they continued to advise students and welcome them to their house.

In retirement, he pursued many outside interests, including opera and classical music. He was a skilled artisan, including repairing antique clocks and making stained glass and screen prints of brass rubbings of 13thC knights from early English churches, which he would give to his friends. He enjoyed making reproductions of antique furniture, including designs from Frank Lloyd Wright.

He is remembered for his kind and generous nature and for being a stalwart and principled friend and scientist. It was a privilege to know him.

Written by Keith E. Gubbins, Paulette Clancy, Michael L. Shuler, and Jefferson Tester