



L. E. (SKIP) SCRIVEN

1931–2007

Elected in 1978

“For application of fluid mechanics to fundamental problems of absorption, interface stability coating flows, surface wetting, and oil recovery.”

BY CHRIS MACOSKO

LAURENCE EDWARD (SKIP) SCRIVEN, faculty member of the Department of Chemical Engineering and Materials Science and Regents Professor at the University of Minnesota, passed away on August 3, 2007, of complications from pancreatic cancer.

Laurence Edward Scriven was born on November 4, 1931, in Battle Creek, Michigan. He was called Skipper as a boy, and the nickname Skip soon stuck. After stops in London and Washington, his family moved to Hillsborough, California, when he was in the seventh grade. In that class he met Dorene, his wife to be. He received his B.S. from the University of California, Berkeley, where he was the “Most Distinguished Student of the Class of 1952.” In 1956 he received his Ph.D. from the University of Delaware under the supervision of Robert Pigford. He worked as a research engineer for Shell Development Company in Emeryville, California, before joining the chemical engineering department at the University of Minnesota in 1959 as an assistant professor. In 1960 he received the Allan Colburn Award of the American Institute of Chemical Engineers. Skip was named a full professor in 1966 and was elected to the National Academy of Engineering in 1978. In 1988 he was selected as regents professor of chemical engineering and materials science, the highest honor a professor can receive from the University of Minnesota.

During his illustrious career, Professor Scriven authored

over 400 publications and advised over 100 Ph.D. students. His research program was internationally renowned, focusing on coating and coating processes. The program excelled at combining experimental, theoretical, and computer modeling approaches in order to better understand industrial coating application processes. "Research education sets the University apart yet industrial interaction is absolutely essential." Skip believed in a comprehensive approach to research. Turning a familiar adage around, he instructed students that ". . . no experimental results can be believed until they are confirmed by theory" (paraphrased). His trajectory for "the education of an engineering scientist" has been adopted by many research advisors:

"Begin with advanced courses for breadth and depth. Simultaneously make a fast start at research with a warm-up problem tracked in weekly meetings and group seminars. Access to multiple advisors, academic experts and industrial visitors is essential. Full-time research required in the first summer with formal presentations in group seminars leading to a thesis plan defended in the spring of the second year."

"As a full PhD candidate, strive for two or more thesis topics. Include experiment, analysis and theory. Learn leadership with supervision of undergraduate researchers and teamwork through collaborations with others, especially industrial researchers. Present research outside to industrial labs, advanced seminars, scientific and engineering societies and employment interviews. All of which leads to a polished thesis which includes already refereed publications" (adapted from the Coating Process Fundamentals Program report at the IPRIME Annual Meeting, 2007).

Professor Scriven was an exacting author, precise with words. One of his former students (Eric Kahler, current president of the University of Minnesota) still has the draft for a first publication nearly solid red with Skip's edits. His 3" x 5" cards in elegant script with pithy research recommendations or appropriate references appeared in the mailboxes of students and colleagues alike.

Skip interacted with and involved industrial engineers and

scientists in his research program, and he was the preeminent authority on coating process fundamentals. He helped launch the International Society of Coating Science and Technology (ISCST) in the early 1980s, and in 1998 the ISCST instituted the L. E. Scriven Young Investigator Award to recognize outstanding young researchers in the field. Professor Scriven was a cofounder of the National Science Foundation's (NSF) Center for Interfacial Engineering (CIE) at the University of Minnesota. After NSF funding ended in 1999 at the urging of its industrial members and through Skip's guidance CIE became IPRIME, or Industrial Partnership for Research in Industrial and Materials Engineering, over 40 companies strong today.

During his career he also made significant contributions to the fields of capillary hydrodynamics, enhanced oil recovery, colloid science, and the theory of interfacial phenomena. His most highly cited papers include analysis of the Marangoni effect (*American Institute of Chemical Engineering Journal*, 1959), a foundational explanation of the origin of bicontinuous structures (*Nature*, 1976), and a description of an apparatus that allows fast freezing of complex liquid specimens for cryomicroscopy (*Journal of Electron Microscopy Technique*, 1988).

Many an undergraduate was launched on a research career by serving as a library runner for Skip. But in addition to his research program, Skip was very much involved in undergraduate instruction in the department. He was the champion for the Unit Operations Lab, the most important chemical engineering lab taken by undergraduates. His Socratic method in the lab was famous. Professor Scriven was also an advocate for and much involved in the team teaching program, a hallmark of Minnesota's Chemical Engineering and Materials Science Department. Skip's graduate course in fluid mechanics was one of a kind. He spent years polishing, sharpening, and perfecting the course.

Professor Scriven held many distinguished visiting professorships and lectureships, and he served on committees for outside and national organizations. He was a fellow of the American Institute of Chemical Engineers and the

Technical Association of the Pulp and Paper Industry. In 1986 he was invited to give the Josiah Willard Gibbs Lecture by the American Mathematical Society. Some of the more recent awards he received included two Roon Awards from the Federation of Societies of Coatings Technology (1993 and 2002), the American Chemical Society's Murphree Award in Industrial and Engineering Chemistry (1990), the Tallmadge Award in Coating Science and Technology (1992), and the Founders Award from the American Institute of Chemical Engineers (1997). Most recently, he received the Roy W. Tess Award in Coatings for 2007 from the American Chemical Society, in recognition of outstanding contributions to coatings science and technology.

Skip very much enjoyed his 18-year tenure as a member of the advisory panel for the David and Lucile Packard Foundation, awarding generous fellowships to young American professors in science and engineering. At his own university, Skip established the Summer Undergraduate Research Participants Endowment and, upon his death, the L. E. and D. H. Scriven Graduate Research Fellowships in the Chemical Engineering and Materials Science Department of the College of Science and Engineering.

In addition to teaching and research, Skip was very involved with the chemical engineering profession and wrote a number of articles on its history. One example is published in *Perspectives in Chemical Engineering*, edited by C. K. Colton (Academic Press, 1991, vol. 16, pp. 1–40).

Although Skip's professional life and work were foremost, he loved music—classical, jazz, South American—and he pursued and actually traveled early western American history. He was an excellent birder, identifying unseen avian singers with his keen ear. He enjoyed the natural life at the family “dacha” in the country, where he also kept a desk, music, and many books and had annual barbeques for his students. Skip is survived by his wife of 58 years, Dorene; their three children, Ellen, Terry Ann, and Mark; five grandchildren; and one great-grandchild.

