



Warren Z. Meade

WARREN LEE McCABE

1899-1982

BY RALPH E. FADUM

WARREN LEE McCABE, recognized as one of the founders of the profession of chemical engineering, and a legend in engineering education for his textbooks and innovative ideas, died in retirement at Black Mountain, North Carolina, on August 24, 1982, just seventeen days after his eighty-third birthday. At that time he was R. J. Reynolds Professor Emeritus of Chemical Engineering at North Carolina State University.

The name "McCabe" is significantly entwined in the history of chemical engineering. A colleague once said, "Ask a junior or senior chemical engineering student, or a process design engineer, to identify the name 'McCabe' and they will invariably call to mind one of the co-authors of the McCabe-Thiele graphical methods for design of distillation columns. Ask another member of our profession the same question and he might recall that McCabe was among the first to call attention to the usefulness of an enthalpy-concentration diagram for binary solutions-or the first to enunciate the LiL law of crystal growth. Ask a contemporary and he will without doubt associate the name with one of the most distinguished chemical engineering educators, researchers, authors, and administrators of the last generation."

Another colleague described Warren McCabe's students and colleagues as "fortunate beneficiaries of his influence through his wisdom, sensitivity, good humor and creativeness."

Born in Bay City, Michigan, on August 7, 1899, Warren Lee

McCabe was drawn to a career in chemical engineering when, just out of high school, he became a chemist's assistant in a wood distillation plant. It was at this time that his interest was aroused in the evolving concept of unit operations—an area with which his name is now synonymous.

This interest led him to the University of Michigan at Ann Arbor where he earned his B.S. degree in chemical engineering in 1922 and his M.S. degree in chemical engineering in 1923. After a period of teaching in the East, he returned to the University of Michigan for his Ph.D. degree in chemical engineering in 1928.

His teaching career included faculty appointments at the Massachusetts Institute of Technology (1923-1925); Worcester Polytechnic Institute (1925); the University of Michigan (1925-1936); Carnegie Institute of Technology (1936-1947), where he served as Head of the Department of Chemical Engineering from 1938 to 1947; Polytechnic Institute of Brooklyn (1953-1964), where he was Administration Dean; and North Carolina State University (1964-1972). He also served as a member of the Chemical Engineering Advisory Council of Princeton University (1949-1955).

His professional and industrial experience included consulting associations with several industries. From 1947 to 1953 he was Director of Research and Vice-President of the Flintkote Company, Whippany, New Jersey.

Among his war activities, he served from 1944 to 1945 as Director of the Central Engineering Laboratory, University of Pennsylvania.

It was during his tenure at Michigan that he and W. L. Badger wrote the textbook *Elements of Chemical Engineering*. This book, published in 1930, has been used by colleges and universities throughout the world. In 1956 he and Professor J. C. Smith of Cornell University wrote a successor text, *Unit Operations of Chemical Engineering*. These landmark publications have strongly influenced the development of chemical engineering.

Throughout his teaching career, Professor McCabe exhibited the highest concern for his students. This was exemplified by the development of the McCabe-Thiele calculation technique for the analysis of distillation columns. This development was motivated by his conviction that much simpler methods of teaching the subject of distilla-

tion to chemical engineers were needed. His rapport with students for more than half a century was legendary among his colleagues. One of them once explained, "A significant effect of his presence was a calming influence on the turbulent times of the late sixties and early seventies in which most technology was under fire and out of favor with a generation of disillusioned students."

At sixty-five, Professor McCabe retired from the Polytechnic Institute of Brooklyn and moved to Chapel Hill, North Carolina, with his devoted wife, Lillian. After he moved South, he was approached by his long-time friend and colleague, the late E. M. Schoenborn, who headed the Department of Chemical Engineering at North Carolina State University, to join his chemical engineering faculty as a Visiting Professor. Warren McCabe's "retirement" turned into a vigorous twelve-year period of productive teaching, research, and writing. He supervised graduate research in crystallization and elucidated the phenomenon of contact nucleation hailed by those in the field as a piece of work of "great significance in describing the crystallization process." During this time he also worked on the third edition of his book on unit operations that was published in 1976.

He frequently joined the Dean of Engineering at North Carolina State University for discussions of engineering education-where it was headed, how it could be improved. He was regarded as the elder statesman of the School of Engineering during his tenure there.

Professor McCabe was very active in the affairs of the American Institute of Chemical Engineers, and he was elected a Fellow in 1971. He served the institute in many capacities, chairing engineering education committees, conducting special assignments, and leading the institute as Director, Vice-President, and President. He was a member of Tau Beta Pi, Sigma Xi, and Pi Tau Alpha; the American Chemical Society, the American Society of Engineering Education, the Association of Engineering Colleges, and the American Society of Mechanical Engineers.

In 1977 Warren McCabe was elected to the National Academy of Engineering and was cited for his "contribution as an educator, researcher, and industrial manager to the understanding and design of chemical separation processes."

Among his many awards are the William H. Walker Award, Founders Award, Warren K. Lewis Award, and Tyler Award from the American Institute of Chemical Engineers; the U.S. Presidential Certificate of Merit (1948); the University of Michigan Distinguished Alumnus Award (1953); the Sesquicentennial Award (1967); and the Golden Key Award of the American Society for Engineering Education.

Perhaps the following words of one of his warmest admirers, Dr. Ronald Rousseau of North Carolina State University, best sum up the life of Dr. Warren Lee McCabe:

Dates, places, titles do not adequately describe the contributions Warren has made as one of the important and distinguished educators during the middle part of the 20th Century. . . . As an engineer and administrator in industry and academics, Warren has interacted with his times, and as a result, he has been a part of historical events in which many of us would like to have participated. . . . **I**t is impossible to measure all that Warren's career has meant to the field of chemical engineering education and to chemical engineering and to society in general.

