



Thomas K. Sherwood

Thomas Kilgore Sherwood

1903-1976

By Hoyt C. Hottel

Thomas Kilgore Sherwood was by any standards one of America's great chemical engineers. His energy, research contributions, applied engineering achievements, and influence on chemical engineering education were prodigious. He was admired and respected by his peers, and countless numbers of them called him friend. He had warmth, charm, orderliness, and a conscience that drove him to use his talents to the fullest to advance chemical engineering in theory and practice.

Tom Sherwood was born in Columbus, Ohio, on July 25, 1903; he died on January 14, 1976. He was the son of Milton Worthington Sherwood and Sadie Tackaberry Sherwood and spent most of his early youth in Montreal. There he received his Bachelor of Science degree from McGill University in 1923. That fall he came to the Massachusetts Institute of Technology (MIT) for graduate work in the Chemical Engineering Department. During an assistantship under W. H. McAdams in 1924-25 he picked up Mac's habit of intense concentration on a problem until it was in shape for safe engineering use. His first paper, coauthored with McAdams and published in 1926 in *Mechanical Engineering*, was "The Flow of Air and Steam in Pipes." His doctorate thesis under Warren K. Lewis, entitled "The Mechanism of the Drying of Solids," was completed in 1929, a year after he had accepted an Assistant Professorship at Worcester Polytechnic Institute. In 1930 he returned to MIT as Assistant Professor and became Associate Professor in 1933 and Professor in 1941. In 1966 he was honored

by a first appointment to the Lamont Dupont Chair in Chemical Engineering. On retirement from MIT, in 1969, he became Professor of Chemical Engineering at the University of California (Berkeley).

During his thirty-nine-year period on MIT'S faculty, Tom's activity included, in addition to a full-time load of teaching, research, and writing, the generation of new subjects in the chemical engineering curriculum, membership on several committees related to improvement of the educational process, and twelve years of primary responsibility for graduate students in chemical engineering. In 1946 he was appointed Dean of Engineering, in which position he faced the difficult early postwar problems of the Institute and, characteristically, worked hard to raise the standards of excellence of MIT'S engineering departments. In 1952 he chose to return to his teaching and research.

Tom's primary research area was a logical development of his early stimulation by McAdams and Lewis-mass transfer and its interaction with flow and with chemical reaction and industrial process operations in which those phenomena played an important part. His rapid rise to the position of world authority in the mass transfer area was accelerated by the appearance of his book, *Absorption and Extraction*, the first significant text in this area, published in 1937. Revised in 1952 with R. L. Pigford, and completely rewritten with Pigford and C. R. Wilke for publication in 1974 under the title *Mass Transfer*, the book has had enormous influence. The worldwide use of the Sherwood Number is a small memorial to that effort. In 1939 Tom's prior introduction of a new subject, applied mathematics in chemical engineering, into MIT'S chemical engineering curriculum culminated in a book of the same name, coauthored with C. E. Reed. An almost completely rewritten edition, coauthored with H. S. Mickley, appeared in 1957. In 1958, *The Properties of Gases and Liquids* was published, coauthored with R. C. Reid. In 1963 two more books appeared, *A Course in Process Design* and *The Role of Diffusion in Catalysis*, the latter coauthored with C. N. Satterfield. Tom's last book-writing effort, *Mass Transfer* -already referred to-was completed less than two years before his death. In addition to these many books, Tom published

some 120 technical papers and a dozen or so editorials or nontechnical papers and gave many invited lectures.

War is an ugly business that incongruously but understandably often draws out of men of good will their best efforts. In 1940 Tom was asked to help begin the organization of chemical engineering manpower for use in the newly organized National Defense Research Committee (NDRC). In 1942 he became a Consultant to the Baruch Committee concerned with synthetic rubber development and in the same year Section Chief for Miscellaneous Chemical Engineering Problems, in NDRC's Chemical Engineering Division. New hydraulic fluids for use at high and at very low temperatures, antifouling coatings for ship bottoms, inerting of gas space in aircraft fuel tanks, development of large screening-smoke generators, production of concentrated hydrogen peroxide—these are a few examples of the many projects that came under his expert supervision. In 1944 he was a Member of the Whitman Committee on the status of jet propulsion. That fall, as a Consultant for the War Department, he went into Europe behind advancing troops on an Army mission on scientific intelligence. Tom was among those of us who looked back on the exciting war days jointly with nostalgia over the intensive research efforts produced and with regret over the source of the stimulation.

Although Tom was primarily an educator, his contact with industry was frequent and effective. He made major contributions in the areas of seawater conversion (he was advisor to the Office of Saline Water), the removal of sulfur dioxide from stack gases, the freeze-drying of blood, the manufacture of penicillin, and the development of various petrochemical processes, including the manufacture of vinyl acetate and oxo alcohols.

The above record in the areas of education, teaching, peacetime research, wartime research, research administration, and industrial consulting eminently justify the adjective "prodigious" to describe Tom's output. This led naturally to recognition by his peers in the form of many honors received through the years. Honorary doctorates were bestowed by Northeastern University, McGill University, and the Technical University of Denmark. Election to the American Academy of Arts and Sciences came in 1948 and to the

National Academy of Sciences in 1958; and Tom was a Founding Member of the National Academy of Engineering. The American Institute of Chemical Engineers, in which Tom was Counselor in 1947-49, awarded him the William H. Walker Award in 1941, the Founders' Award in 1963, and the Lewis Award in 1972. The American Chemical Society bestowed the Murphree Award on him in 1973. The Chemical Institute of Canada made him an Honorary Member. For his war work, he received the U.S. Medal for Merit in 1948.

A personal note: We were graduate students and roommates in early MIT days; our paths crossed frequently, particularly during the war years; and we spent an idyllic month together climbing the Grand Tetons in 1951. Tom lived a full life of outstanding service to his profession and his fellow man. His peers salute his memory. He will long be remembered.

