

## MEMORIAL RESOLUTION

### FREDERICK OTTO KOENIG (1902 – 1974)

Fred Koenig was a man of many passions - for beauty in all of its forms; for understanding science, particularly thermodynamics at the most fundamental level; for clear, logical thinking and expression in writing and speech; for history; for opera; and for seeing everything worth seeing in the worlds of art, architecture, and natural wonder. In his early years, he climbed the Matterhorn three times, and, with his brother, made a two hundred mile canoe and portage trip through northern Canada, ending in James Bay. He visited Europe regularly, seeking out the origins of western thought and art, and was not content until he saw with his own eyes the relics of the Incan and Mayan cultures. During his later years, he intensified his travels, despite a painful and disabling hip condition. He said there was much to be seen while he could still get around. And travel he did until a heart attack ended his life at 71 on July 5, 1974.

He served thirty-seven years on the Stanford chemistry faculty, becoming emeritus in 1968. He returned in 1973 to teach a three-quarter course on the history of science, a subject of lifelong interest second only to thermodynamics in his professional life. Outstanding among his publications in the history of science is the chapter "The History of Science and of the Second Law of Thermodynamics" in "Men and Moments in the History of Science" edited by his friend H. M. Evans.

Frederick Otto Koenig was born in New York, N.Y., October 15, 1902, to parents operating a preparatory school (now the Franklin School) where he received his elementary education. He followed his undergraduate years at Harvard with doctoral work directed by the distinguished electrochemist Kasimir Fajans at the University of Munich, obtaining his doctorate in 1929. Prior to coming to Stanford in 1931, he was a National Research Council Fellow at the University of California, Berkeley. He was named full professor in 1943 and won two Guggenheim Fellowships while at Stanford. He taught physical chemistry and graduate thermodynamics and was a mainstay in the freshman chemistry program for several years. In the latter capacity, he did much to improve the first-year course by his example of rigorous thinking, the careful clarity with which he lectured, and by gentle, constructive corrections of loose or inaccurate thinking on the part of his colleagues.

His doctoral work with Fajans led to a publication, in the "Handbuch der Physik," on the electrocapillary curve which became a classic in its field. Other studies of the thermodynamics of electrolyte systems followed, notably a pioneering investigation of the effect of the gravitational field on the chemical potential of electrolytes. He developed what still stands as perhaps the clearest and most elegant formulation for expressing and teaching the ideas of J. Willard Gibbs on the nature of chemical equilibrium. His clarifications and elegant statements of the state principle, which underlies the Phase Rule and related subjects, have long since become commonplace among the foundation elements in texts and treatises on thermodynamics. In the past few years, he was much occupied with one of the most fundamental and difficult topics in chemical thermodynamics - the "economical" description of chemical systems in terms of "components." The concept of a set of descriptive components - though basic to the Phase Rule

enunciated by Gibbs - was never thoroughly treated by Gibbs nor by generations of later workers until Koenig undertook a critical study of this matter that led to a definitive work on components.

Professor Koenig was never intellectually idle and he was never intellectually trivial. He directed his energies and attention to difficult problems, and he was always ready to undertake the study of additional subjects as they bore on and facilitated his main purpose of understanding the basic principles of thermodynamics. Among thermodynamicists of note, he always enjoyed a high reputation, not only for his clear, urbane and elegant contributions, but also for his friendly, unbiased assistance to fellow scholars. His wisdom, clarity of view, and constructively critical examination of new ideas were a source of much educational value - not only to his students, but perhaps more particularly to his faculty colleagues, who rarely came away from discussions with him without having their ideas clarified and sharpened.

Students and colleagues will miss Fred's example, his ever-willing help, his genial good humor, and sparkling and illuminating anecdotes drawn from his remarkable fund of historical knowledge of all sorts. For their particular loss, we extend our sympathies to his wife Inge and their son Franklin, to his former wife, Marie Luise, and sons Frederick and George, and to his brother Robert.

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