

## PROFILES IN TOXICOLOGY

### James Hervi Sterner, 1904–1992

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A pioneer in industrial toxicology, industrial hygiene, and occupational medicine, Jim Sterner was a distinguished leader in all three disciplines. Born in Bloomsburg, Pennsylvania in 1904, Dr. Sterner graduated from Pennsylvania State College in 1928 where he was elected to Phi Beta Kappa. In 1932 he received his medical degree from Harvard University, followed by a four-year residency in internal medicine at the Lankenau Hospital in Philadelphia.

Dr. Sterner's initial career objective was to practice internal medicine in Philadelphia. However, this plan was changed by an invitation from Dr. William Sawyer, Medical Director of Eastman Kodak Company, to Rochester to discuss the development of a laboratory of industrial medicine. Dupont's Haskell Laboratory for Toxicology and Industrial Medicine and Dow's Laboratory of Industrial Medicine had just been established. Kodak's facility would be the third in American industry. With a strong background in chemistry and medicine, Dr. Sterner envisioned the laboratory director's job as a unique career opportunity, and he accepted Dr. Sawyer's offer. Dr. Sterner served as the director of the Laboratory of Industrial Medicine at Kodak from 1936–1948.

In 1936 industrial toxicologists and industrial hygienists were not being formally trained, so Dr. Sterner had to look for chemists, physicists, and engineers in various Kodak departments to carry out the work of the laboratory. In the Department of Manufacturing Experiments, he found a chemist, Dr. Emmett Carver, who had already been developing industrial hygiene methods to measure solvent-vapor concentrations within machines for making photographic film base. Dr. Carver had also made a contact with the newly opened medical school at the University of Rochester to carry out toxicology studies on a plasticizer used in the new acetate film base. Dr. Sterner renewed the medical school relationship, developing a close tie with Dr. Harold Hodge, the Society of Toxicology's first president, to help with industrial toxicology matters until a toxicology section could be established in the laboratory.

At the Tennessee Eastman Company, Dr. Sterner brought in Frank Ogelsby, a chemist from the research laboratories, to

establish an industrial hygiene laboratory at this manufacturing division. Jim Sterner placed great emphasis on applying toxicologic evaluation to the design of work processes and places. To that end he employed a physician in the laboratory who was also a trained engineer, Dr. Edward Riley, who could serve as liaison with the process engineers.

One of the early toxicology problems Dr. Sterner encountered was that of skin sensitization related to exposure to photographic developers. Dr. Karl Landsteiner at the Rockefeller Institute was investigating the immunologic basis of chemical sensitization, and Dr. Sterner was quite interested in spending some time in Dr. Landsteiner's laboratory. He contacted Dr. Landsteiner, who was not very receptive to the idea of having someone from industry come to work at the Institute. Not one to be easily discouraged, Dr. Sterner asked Dr. George Whipple, Dean of the Medical School, if he could help. A single phone call to Dr. Landsteiner was all that was needed and Dr. Sterner spent a productive month in Landsteiner's laboratory. Upon returning to Kodak, Dr. Sterner developed techniques for evaluating chemicals as potential skin sensitizers. This provided invaluable data for Kodak scientists in research and development who were considering new chemical formulations. In addition, he brought back an understanding of the factors determining sensitization, such as the amount of the sensitizer absorbed through the skin. This led to his development of preventive measures to be taken in the workplace to reduce the risk of sensitization.

With the onset of World War II, Kodak's Tennessee Eastman Company established the Holston Ordnance Works and the Clinton Engineering Works as one of three plants in the atomic bomb project at Oak Ridge, Tennessee. Dr. Sterner served as medical director for the Clinton Works and was the consultant in industrial toxicology and industrial hygiene. To prepare for this assignment, he spent one week each month for a year studying atomic energy and radiation at the University of California in Berkeley. Following the war he served as a consultant in occupational health to the Atomic Energy Commission's Division of Occupational Safety, and he was a medical consultant for the Bikini Atoll atomic bomb tests. He was a member of the Expert Committee on Radiation for the World

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Health Organization and collaborated on the Report on Medical Supervision in Radiation Work.

Industrial toxicology was always one of Jim Sterner's major interests. In 1949 he saw a need to develop a realistic and practical toxicity rating system for risk assessment of chemicals studied in the laboratory. In a joint effort with Harold Hodge, a system was developed based on median lethal doses in animal studies and human experience. Six numerical levels of toxicity were used to rate substances from those that were "practically nontoxic" to those that were "supertoxic." The Sterner-Hodge classification (Sterner and Hodge, 1949) has been used extensively in poison control centers for many years for placing chemicals in categories related to their lethality (Gleason *et al.*, 1957).

In 1950, Dr. Sterner was appointed Medical Director of Eastman Kodak Company. During his tenure as medical director he continued to introduce forward-thinking concepts in occupational medicine. In the mid-1950s he visualized a need to develop a morbidity-mortality database for epidemiologic studies on the health of the workforce. He selected a bright young statistician from within the company to develop the program. Morbidity data were collected from return-to-work slips completed in the medical department on employees who had been out ill for at least three days. Mortality data came from the company's life insurance program. Population data were obtained from the personnel department. Health data obtained in departmental surveys were also added to the database. This innovative program proved to be extremely valuable over the ensuing years in many epidemiologic studies.

Dr. Sterner retired as medical director in 1968 and accepted an offer to be professor of environmental health in the newly established School of Public Health of the University of Texas in Houston. He also served as acting dean and then as associate dean at the school. Upon the sudden death of the Director of Public Health in Houston, Dr. Sterner served for a time as the acting Director of Public Health for the city. After an 11-year period at the School of Public Health, he retired for the second time and moved to California. He did not stay away from academia very long. In 1975 he was asked to take the post of clinical professor of occupational medicine at the University of California in Irvine. He held this position for a 10-year period.

Jim Sterner was widely recognized as an astute, energetic leader during the period of unprecedented growth of occupational medicine. He was actively involved in the major effort to obtain American Medical Association recognition and approval of occupational medicine as a medical specialty, and was a member of the first American Board of Occupational Medicine. From his earliest days in the Laboratory, he saw the importance of physicians in industry working closely with colleagues in toxicology, industrial hygiene, engineering, safety, epidemiology, biomechanics, and health education. Prevention is the cornerstone of occupational medicine: understanding the relationship between one's work and personal health, preventing illness and injury, minimizing stress in the

work environment, and addressing human factors that require change in order to provide a more salubrious workplace. These were the principles Dr. Sterner taught and practiced.

The vast extent of Dr. Sterner's influence in occupational medicine can be appreciated in light of his membership in 34 professional organizations. He was chairman of the Council on Occupational Health and the Council on Environmental and Public Health for the American Medical Association. He served on the Commission on Toxicology and Industrial Hygiene for the International Union of Chemistry. For the National Academy of Sciences and the National Research Council, Dr. Sterner served on the Committee on Toxicology and the Committee on Environmental Physiology. He was president of the National Health Council, the American Academy of Occupational Medicine, the American Board of Preventive Medicine, the American College of Preventive Medicine, and the American Industrial Hygiene Association. He was a member of five different committees for the U.S. Atomic Energy Commission and five committees of the U.S. Public Health Service. He served as chairman of the Environmental Health Advisory Committee of the Manufacturing Chemists Association and was Head of the National Air Conservation Commission. He served on the National Advisory Health Committee to the Surgeon General of the U.S. Public Health Service.

Widely recognized for his significant contributions, he received the Knudsen Award from the Industrial Medical Association for the most outstanding contribution in industrial medicine in 1956-57. The Industrial Hygiene Association presented the Cummings Award to Dr. Sterner for outstanding contributions to the knowledge and practice of the profession of industrial hygiene. He received the Award of Honor from the American Academy of Occupational Medicine for outstanding service in the field of occupational medicine. In 1963 he received the Albert D. Kaiser Medal from the Rochester Academy of Medicine for distinguished service in occupational medicine and pioneering in the prevention of atomic radiation hazards. The New York State Academy of Preventive Medicine honored Dr. Sterner with its award for exceptional achievement in preventive medicine in 1963.

Dr. Sterner's published works reflect his broad interest and expertise in toxicology, industrial hygiene, atomic energy, environmental health, and occupational medicine. He received a citation from the Industrial Medical Association for excellence in medical authorship for his paper written with Merrill Eisenbud on the epidemiology of beryllium intoxication (Sterner and Eisenbud, 1951). Jim was an inspiring leader who instilled confidence in young colleagues and students. A superb teacher, he had the ability to make complex issues appear straightforward and clear. Friendliness, a sense of humor, and a high level of enthusiasm were among his many attributes worthy of emulation.

His distinction as a pioneer was his ability to visualize and to implement the whole spectrum of preventive occupational health measures: toxicity testing to guide safe handling and

process design, industrial hygiene evaluation to check on exposures and adequacy of safeguards, and medical examinations and epidemiologic studies to verify the preventive efficacy of the entire program.

Jim Sterner was truly “a man for all seasons” in occupational health. He epitomized the conscience of a corporation: his purpose was to protect people in their work environment and in their use of chemical and physical materials, advise customers about potential hazards in using the company’s products, assist manufacturing units in selecting safe materials and chemicals for new processes and products, and protect the external environment by controlling chemical effluents. His efforts to protect the health of humankind were exemplary.

#### ACKNOWLEDGMENT

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