

Samuel Epstein
1919-2001



Samuel Epstein, 81, the William E. Leonhard Professor Geochemistry, Emeritus, passed away on September 17, 2001.

He was born near Kobryn, Poland (now Belarus) in 1919. In 1927, Epstein's family moved to Winnipeg, Manitoba, Canada, and after graduating from high school in 1937, he attended the University of Manitoba where he received a B.Sc. in geology and chemistry in 1941 and a M.Sc. in chemistry in 1942. In 1944 he received his Ph.D. in chemistry at McGill University where he worked on the kinetics of reactions involving the high explosive RDX.

Epstein then worked on rare gas fission products for the Canadian Atomic Energy Project in Montreal, where he met his future wife, Diane Vool. He was recommended to Nobel Laureate Harold Urey as an ideal research fellow to work on the oxygen isotope paleotemperature project that Urey was then initiating at the University of Chicago.

Seizing this opportunity to work with a famous scientist on a truly fascinating scientific problem, Epstein and his bride Diane moved to Chicago in 1947. He dove into the carbonate paleotemperature project with immense drive and dedication. Within several years, he and his research team made what is widely regarded as the most significant scientific contribution in the history of stable isotope geochemistry: they measured the temperature coefficient of the oxygen isotope exchange reaction between CaCO_3 and H_2O and developed astonishingly precise methods to measure oxygen isotope ratios of marine carbonate fossils. This allowed them to calculate the temperatures of the ancient oceans more than 70 million years ago.

In June 1952, Professor Harrison Brown moved from the University of Chicago to start the geochemistry program at Caltech, and he invited Epstein to join him. Over the succeeding years at Caltech, Epstein explored a variety of uncharted scientific terrains, welcoming the prospect of applying the newly developed techniques and principles of stable isotope chemistry to almost every aspect of natural science. He applied oxygen, carbon, hydrogen, and silicon isotope studies to problems of botany, plant and animal physiology, photosynthesis, biochemistry, meteorology, Pleistocene climatology, glaciology, and ore deposits, and in many papers on igneous, metamorphic and sedimentary petrology, as well as carrying out important research on the Antarctic and Greenland ice sheets, on isotope geothermometry, on modern geothermal systems, and on the origin of meteorites, tektites, and lunar rocks and minerals.

Epstein's many graduate students and postdoctoral fellows have established their own laboratories all over the world. He left indelible marks on the members of his extended scientific family, particularly through his intuitive feel for seemingly intractable, but very important problems that he solved with clever laboratory work, a refusal to become bogged down in extraneous and unimportant details, and an understanding of the intrinsic accuracy required for a given measurement to be decisive.

Epstein was widely recognized for his monumental scientific achievements. He was a recipient of the Goldschmidt Medal of the Geochemical Society in 1977, the Day Medal of the Geological Society of America in 1976, the Wollaston Medal of the Geological Society of London in 1977, and the Urey Medal of the European Association of Geochemistry in 1995. In 1976, he was elected to both the National Academy of Sciences and the American Academy of Arts and Sciences, and was president of the Geochemical Society in 1978-79. In 1980, he received the

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honorary degree LL.D. from his alma mater, the University of Manitoba, and in 1997 he was elected a fellow of the Royal Society of Canada.

Epstein retired from teaching in June 1990, but up until just a few months ago he still continued to work fulltime in the laboratory every day. He is survived by his wife Diane, two sons, Reuben and Albert, and three grandchildren.

*Credits to the California Institute of Technology
September 18, 2001*