HAROLD C. HELGESON
1931–2007

Harold C. Helgeson, professor of geochemistry at the University of California, Berkeley, died on May 28 at the age of 75, after a brief battle with lung cancer. Professor Helgeson was widely regarded as the founder and preeminent practitioner of theoretical geochemistry for more than forty years, a career he embraced after a colorful set of experiences in the military and the mining industry. In addition to his published work, which was prodigious, he traveled and lectured extensively. His lectures were famous for their complex diagrams and clarity, and for the sheer force of their delivery. Professor Helgeson typically delivered his potent lectures after virtually no sleep because he so enjoyed extending his social and scientific interactions into the early morning hours. Few hosts could keep up with his schedule, but they never forgot the experience! He received the most prestigious international awards in geochemistry in honor of his research contributions, including the Goldschmidt Medal from the Geochemical Society (1998) and the Urey Medal from the European Association for Geochemistry (2004).

Harold Helgeson was born on November 13, 1931, in Minneapolis, Minnesota, and grew up in St. Paul, Minnesota. After completing his BS degree in geology at Michigan State University, he worked for a year in 1953–1954 as an exploration geologist for Technical Mine Consultants in Athabasca, Saskatchewan, in the Northwest Territories, and at Blind River, Ontario. He then served for two years in the Korean War as a photo-radar intelligence officer in the 497th Recon. Tech. Squadron of the U.S. Air Force in Wiesbaden, Germany. Part of his job was to interrogate agents who had just returned from their missions. In later years, many students and even seasoned professional scientists would quail at the rigors of his interrogative skills. After his military service he spent four years as a mining and exploration geologist for Anglo-American Corporation in South Africa, first in diamond exploration for the DeBeers subsidiary of the company in southwest Africa and then as an underground mining geologist at the President Steyn Gold Mine in Welkom, South Africa, and the Nkana Copper Mine in Kitwe, Zambia. It was while very deep underground in one of these mines that he suddenly realized he might find a different career appealing.

In 1959 he returned to graduate school at Harvard University, where he studied with Robert M. Garrels, a pioneer in low-temperature geochemistry. Garrels took to this unusual, demanding graduate student, even tutoring him privately. They became close friends, and after receiving a PhD in 1962, Helgeson published his thesis as a book in 1964, establishing the foundations of theoretical high-temperature geochemistry. After a stint as a research chemist for Shell Development Company in Houston, Texas, investigating geothermal fields, Helgeson in 1965 joined Garrels at Northwestern University, where he began his teaching career. Over the next five years, he, Garrels, and F.T. Mackenzie published a series of definitive papers on the theory of water–rock interaction at low and high temperatures and pressures, and Helgeson published a paper on the first internally consistent thermodynamic datafile for carrying out applications of that theory. In 1970, Helgeson joined the faculty at the University of California, Berkeley, and between 1974 and 1990, this work was expanded to become a comprehensive predictive approach, scrupulously documented in papers of unusual length and detail. Although many found these papers intimidating, those who made the effort to read them found them to be models of clarity and scholarship. Helgeson always maintained that he was writing for posterity. At the same time, he was a pioneer in the application of computer calculations that made use of his results, and the computer codes produced in his laboratory of theoretical geochemistry, known as "Prediction Central," were used by geoscientists and engineers around the world.

During the last twenty years, Professor Helgeson continued to teach and carry out theoretical research and consulting in high-temperature and high-pressure solution chemistry and in the thermodynamics and kinetics of hydrothermal and geothermal systems, but his interests continued to evolve. Together with his students and collaborators, he pioneered the development of a unified predictive theoretical approach to both the inorganic and the organic chemical realms, with applications in petroleum geochemistry, biogeochemistry, and the chemical interactions of minerals, microbes, and aqueous species in geochemical processes. Right into the last month of his life he was revising what may prove to be a seminal paper advancing a new theory for the origin of petroleum.

Professor Helgeson leaves behind not only a large and illustrious contribution to the scientific literature, one that posterity will use as a guide for decades, but a multitude of former students and associates with whom he was incredibly generous with his time and in his concern for their welfare. Everyone who had the privilege of working in "Prediction Central" discovered a remarkably disciplined scientific dedication to productivity combined with the joy of discovery. He is survived by his widow France and daughter Broghan, and from his first marriage his son Christopher and daughter Kimberley, and three grandchildren, Jeremy, Nicolas, and Alexander.

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