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Memorial for Julian Royce Goldsmith, 1918–1999

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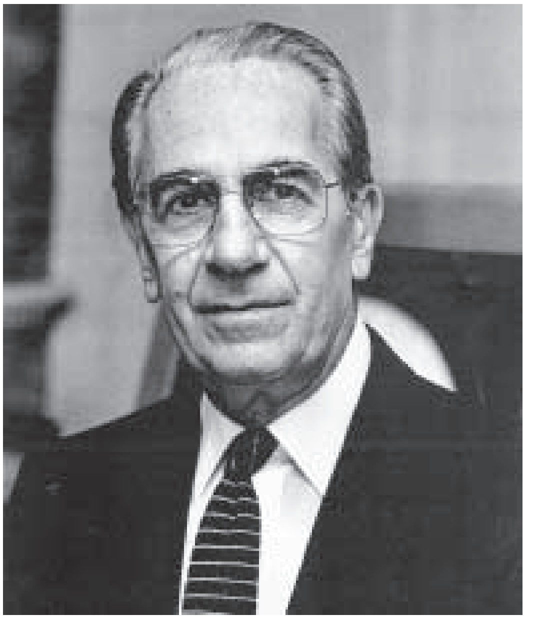

Julian Goldsmith served as the president of the Mineralogical Society of America (1971), the Geological Society of America (1975), and The Geochemical Society (1965). Julian performed major research in mineralogy, was a beloved teacher and friend, and probably one of the best administrators in the history of the earth sciences at the University of Chicago.

He was a graduate of the University of Chicago and spent his academic career there. He departed from Chicago only during World War II to do defense research at the Corning Glass Works in up state New York. After the war he returned to Chicago where he completed his Ph.D. requirements in 1947. His thesis advisor was the legendary Norman L. Bowen, who was, without exaggeration, the most influential experimental petrologist of the 20th century.

His career at Chicago began as a Research Associate in 1947 and advanced through the ranks to full Professor in 1958. In 1969 he was made Distinguished Service Professor, and Professor Emeritus in 1990 when he (pretended to) "retire."

In 1947 Bowen departed from Chicago to go to the Geophysical Laboratory. Julian inherited Bowen's lab, consisting of a few high-temperature ovens, open to the air. By 1950, Julian was able to add some externally heated hydrothermal pressure units and an X-ray diffractometer to greatly aid in phase identifications, rather than having to rely entirely upon optical microscopy.

In 1948, largely through Julian's efforts, the German crystallographer Fritz Laves came to Chicago. The two of them made a formidable team for the next six years. They produced a series of groundbreaking experimental results on the alkali feldspars, focusing on Al-Si order and disorder, including the thermal disordering of well-ordered natural microcline. During this work they developed an X-ray diffraction method to measure the degree of atomic order in alkali feldspars; this method still finds use today. Laves departed from Chicago in 1954 to take a professorship at ETH in Zurich, Switzerland. In 1955 Julian received the Mineralogical Society of America Award for his work on feldspars.

After the daunting alkali feldspar system, Julian turned to work on the equally daunting carbonates. With a series of colleagues, graduate students, and post-docs he probed the mysteries of solid solutions and cation ordering in rhombohedral carbonates.

Julian had an exceptionally amiable personality. He had always a positive attitude and formed excellent relations with students and other faculty members. This characteristic led to a series of administrative positions in which he was extraordinarily effective. In the 1960s he became Associate Dean of the Physical Sciences Division at the university, a board member of the National Science Foundation (1964–1970) and Chairman of the newly formed Department of the Geophysical Sciences (1963–1971). Julian loved to point out that the name, Department of THE Geophysical Sciences was not meant to sound snooty. The "The" was inserted to prevent the acronym from being DOGS — which it became anyway!

The University of Chicago was undergoing considerable reorganization at the time. The department to which Julian had belonged was called simply the Department of Geology. On campus there was also a Department of Meteorology. But both traditional geology and traditional meteorology were changing. More and more the natural sciences that dealt with the earth were becoming less compartmentalized. The new Department of the Geophysical Sciences was a merger of these two, earth-focused departments. It is notable that during the following decade more and more departments of (simply) geology became departments of earth and atmospheric sciences, earth and planetary sciences, geology and geophysics, geology and geochemistry, et cetera. The trend continues today in additional areas of study with the merging of research in portions of physics, chemistry, genetics, and computer science, generating formidable names like "department of chemical biophysics."

For DOGS to fulfill its potential, it needed better quarters. Julian dug in to raise funds for a new building that would hold the entire unified department. He succeeded famously and by

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1968 the new Henry Hinds Laboratory was built and the staff moved in. Julian's personality and his ability to handle difficult situations led to a smooth integration of the departments. After nine years as chairman, Julian felt that all was running well. He gave up his chairmanship and returned to full time research and teaching.

In the subsequent years he returned to work on carbonates and feldspars, and with fellow faculty member, Bob Newton, worked out the calcite-dolomite solvus and the alkali feldspar solvus. Combining feldspars with carbonates seemed a natural direction to go, and he and Newton turned to the scapolites. One thing, however, had always bugged Julian. He could disorder a well-ordered alkali feldspar, but neither he nor other researchers had ever succeeded in understanding reversible order-disorder relations as a function of temperature. It was in the early 1980s that he encountered the answer. He discovered that above 10 kilobars he could reversibly order and disorder albite at temperatures as low as 700° to 900° C, all without any mineral flux! It turned out that the sodium chloride pressure medium contained minor amounts of adsorbed water. The water reacted with graphite in the heating apparatus to release monatomic hydrogen, which diffused through the inner platinum sample chamber. The hydrogen became a catalyst for the ordering reactions within the mineral lattice, and the reactivity of the hydrogen was strongly dependent on pressure.

At first, no one believed his explanation of the phenomenon, but it turned out that his explanation was correct. He and a series of colleagues were able to establish the first reversible order-disorder curve for albite. He then went on to attack the problem with potassium feldspar. He was able to disorder microcline at lower temperatures than he had when he worked with Fritz Laves, and succeeded in forming intermediate potassium feldspar ordered states, but he never succeeded in synthesizing a well-ordered microcline. It was, in his mind, one of those mysteries not yet to be revealed. Nature could do it and he knew that someday someone would be able to do it in a laboratory.

Julian then went on to run a series of experiments to examine the equilibrium partition of the stable oxygen isotopes between several major minerals. He did this work with his colleague, and fellow faculty member, Robert Clayton, who is an outstanding authority on the distribution of stable oxygen isotopes in mineral systems. These results led to practical mineral thermometry.

In 1987 Julian received the Hess Medal from the American Geophysical Union and in 1988 MSA awarded him its highest honor, the Roebling Medal.

Throughout his career, Julian was always the bright spirit in his associations with others. I never had the occasion to work with him in his lab, but I knew his work and used it in my own research. On several occasions I sought him for advice on some unusual mineralogical situations encountered in my own research. He could be counted on to strike a positive note in any situation, especially in some of those situations we have all encountered in the academic world, a bitter disagreement between colleagues. He calmed many a hot head. He was also a font of just plain good fun. He had a joke to tell you, or a funny situation to describe whenever you saw him. What shook all of us who knew him was that during all of this good humor he was constantly aware of the leukemia that eventually won its battle with him. He never showed any overt sign of depression over this. After taking formal retirement in 1990, he continued for almost nine more years coming into the lab and running experiments.

The broader world of mineralogy will miss him as a person and as a researcher. For those of us, however, who people "Julian's building" — Hinds Laboratory — we shall never enter the building without automatically glancing down the first floor west corridor to see if Julian's lab door is open, a welcoming light shining from his office, and the prospect of a cheerful conversation in the offing to start the new day.

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