

Presentation of the Roebling Medal of the Mineralogical Society of America for 1992 to Hatten S. Yoder, Jr.

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As a still-wet-behind-the-ears Johns Hopkins graduate student, harboring some fear and trepidation, I came down to the Geophysical Laboratory in September, 1955, to begin research there as a predoctoral fellow. What a day! I was given a whirlwind tour of the Lab and staff—half an hour each with Frank Schairer, Joe Boyd, Hans Eugster, Felix Chayes, and the rest. I never even got to “wash my hands,” as they euphemistically spoke of it in those days. By noon my eyes were glazed from scientific overload, but still had the afternoon in prospect. Mercifully, we all went to lunch. “Who’s that tall, young guy?” I asked someone. “Hat Yoder.” “Naw, he’s an old guy, isn’t he?” “Nope, that’s him!”

I was flabbergasted. This hard-charging, exuberant, indefatigable petrologist with the broad, broad smile and infectious laugh, spouting phase equilibria while studying the menu, seemed far too young to have completed comprehensive, detailed investigations of the system $MgO-Al_2O_3-SiO_2-H_2O$, the metamorphic facies concept and the influence of bulk composition, and the role of H_2O in metamorphism, as well as seminal studies on rock-forming minerals such as grossular, analcime, phlogopite, muscovite, and—ye gods—the ternary feldspars. These were classics! But, it was Yoder, all right. Maybe he just looked young, because he spent World War II frozen solid in eastern Siberia, manning a weather station for the U.S. Navy.

This man’s scholarly productivity has been prodigious, and was sustained even as he served as Director of the Geophysical Laboratory from 1971 to 1986. Hat was elected to membership in the National Academy of Sciences in 1958 (at the tender age of 37—the youngest geologist ever elected to the NAS) and has served the Academy and the National Research Council with dedication and real distinction. I especially remember a meticulous and exhaustive review of an Academy manuscript dealing with the health hazards of asbestiform minerals. Along with Mac Ross and E-An Zen, he waged an intellectually sound but losing battle to correct the misguided report. They went down with guns blazing, and society was the real loser, for the nation is now saddled with unrealistic OSHA-mandated regulations.

But, back to some of Hat’s many successes. One has to be choosy because there are so many. With Gunnar Kullerud, he conducted pioneering research on stability re-

lations of the sulfides in work that is still quoted today. Yoder’s landmark experimental studies on natural basalts with Cecil Tilley quantified the classical metamorphic facies concept in terms of state variables, pressure, and temperature. It proposed the very useful concepts of the basalt tetrahedron and the master flow sheet for igneous rocks. According to *Current Contents*, the Yoder and Tilley paper was the most cited paper in the geological sciences during the period 1961–1980. Synthetic system studies at low and high pressures with Frank Schairer and Ike Kushiro, respectively, vastly extended our knowledge of igneous petrogenesis, both within the Earth’s crust and the upper mantle. His books, *Evolution of the Igneous Rocks: Fiftieth Anniversary Perspectives* and *Generation of Basaltic Magma*, are leading reference volumes today for the study of magmatic processes and igneous rocks. His recent experimental studies on heat transfer during the crystallization of heterogeneous silicate-melt systems are shedding new light on energy transfer in the outer portions of the planet.

This Society presented him with the MSA Award in 1954; he guided us as MSA President in 1972. Other honors include the Columbia University Bicentennial Medal, 1954; the Arthur L. Day Medal, Geological Society of America, 1962; the Arthur L. Day Prize and Lectureship, National Academy of Sciences, 1972; the A. G. Werner Medal, German Mineralogical Society, 1973; the Golden Plate Award, American Academy of Achievement, 1973; and the Wollaston Medal, Geological Society of London, 1979. My guess, though, is that he considers his membership in the Geophysical Laboratory since 1948 as his greatest honor.

Hat is a giant among mineralogists, petrologists, and geochemists, but his influence has been much magnified through the training (mostly by example) of several generations of graduate students and postdocs. I wasn’t one of them, so it is not self-congratulatory for me to suggest that his impact on the course of experimental geochemistry may be gauged even more by the stable of eminently successful students he inspired than by Hat’s own remarkable scientific accomplishments. I can think of no scientist more qualified to receive the Roebling Medal. Mr. President, I give you the man who filled Norman L. Bowen’s shoes, both spatially and intellectually, Hatten S. Yoder, Jr., MSA Roebling Medalist for 1992.