

Acceptance of the Roebling Medal for 2010 of the Mineralogical Society of America

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When I think about all the good luck I've had, it seems miraculous. My first big break was when I went to live with my sister, Leslie, and brother-in-law Holly Wagner. Holly was a career-long U.S. Geological Survey geologist then stationed in Lawrence, Kansas. I started college at the University of Kansas. When I asked Holly "What should I study?" He replied "Geology has been good to me. Why don't you try that?" Geology has been very good for me, also.

My next lucky break was going to work with George Kennedy as a graduate student in UCLA. George was building several kinds of high P - T experimental apparatus, and I got there just at the right time to learn experimental petrology. On the theoretical side, my other George mentor, George Tunell, grilled and drilled me on elementary thermodynamics. At the time that seemed like an ordeal, but later I was to become very grateful for his interest in me. Another great thing that happened was that I got acquainted with Julian Goldsmith. He spent two summers away from the University of Chicago doing experiments in Kennedy's lab.

When I was about to graduate from UCLA Julian invited me to apply for an opening in the newly formed Department of the Geophysical Sciences at Chicago. I made haste to do so and never considered any other job possibilities. That decision was most fortunate—in 1963 our new department was getting a lot of start-up money from the National Science Foundation. Julian and I built an experimental lab in the NSF-funded Hinds Laboratory. We worked together as colleagues for many years.

Chicago in the 1960s and 1970s was a great place to be a mineralogist-petrologist. Julian and Peter Wyllie were carrying on the high tradition started by Norman Bowen and Hans Ramberg. Joe Smith outfitted our department with one of the first electron microprobes in an Earth science department. We had some tremendous co-workers in those years, including Bernie Wood, Tim Holland, Dex Perkins, and Jim Eckert and many students who have since become foremost contributors. Jiba Ganguly was my first Ph.D. student. Alex Navrotsky was doing her great thesis work under Ole Kleppa on the thermochemistry of spinels. Mark Barton and Tren Hasleton did important mineralogical research as students. Dave Jenkins, Andrea Koziol, and Ed Hansen continued collaborating with our group well beyond graduation.

In 1983, Fred Anderson and I became co-editors of the *Journal of Geology*, taking over from Pete Wyllie. For the next 14 years I had the privilege of working with Fred. He and I had the honor of presiding over the centennial celebration of the *Journal* in 1993. After I stepped down in 1997, one year before I retired



from the University, Fred carried on as Editor for another ten years. I think that makes him one of the longest-serving editors of a major Earth science journal.

Three strokes of good luck befell me in 1994. The first was reading Craig Manning's great paper on experimental solubility of quartz at high P and T . Craig extended the measurements up to the realm of deep crust and upper mantle metamorphic conditions, and then summarized his and all other measurements in a single equation, which accurately describes quartz solubility clear down to groundwater conditions. I knew that people would start making important calculations of mass transport in the earth with Craig's equation, and that I would eventually want to get into the mineral solubility business. Craig gave me that opportunity in 1998. The next lucky thing was that I persuaded Leonya Aronovich to come to Chicago. I had met Leonya a couple of years before at a meeting in Calgary. I was much attracted by his work, both experimental and theoretical, on the role of complex fluids in high-grade metamorphism, a field that was much neglected in this country but one that was well developed by several prominent Russians, including D.S. Korzhinsky. Jacques Touret first got me interested in this subject when he described his pioneering fluid inclusion work at a Gordon conference in the early 1970s, and I followed Jacques' work in the literature over several years.

Leonya's arrival in Chicago was propitiously timed to get me started in experimental fluid-mineral interaction at high T and P . The third piece of good luck was the passage in 1994 of the Age Discrimination Act, which told the University of Chicago that they couldn't terminate me at age 65. Chicago responded by offering me a very handsome buy-out package. My golden parachute landed me back at UCLA in Craig Manning's lab. We have had a very happy collaboration. We work in the Geology Building space formerly occupied by David Griggs and later by Art Montana, one floor down from George Kennedy's old lab.

I can't forget what Julian Goldsmith said to me when he got the Roebling Medal in 1988: "Some people think of the Roebling Medal as a career achievement award. For me, it's a great encouragement to keep on doing the things I think need to get done." And, indeed, Julian did some of his best work during the several years after he got the medal.

The award of the 2010 Roebling Medal is likewise a great encouragement to me. Ladies and gentlemen of the Mineralogical Society of America, MSA officers and councilors, please accept my profound gratitude for the inspiration you have given me.