

## Acceptance of the Roebling Medal of the Mineralogical Society of America for 2004

### MARGUERITE “MARGO” KINGSTON

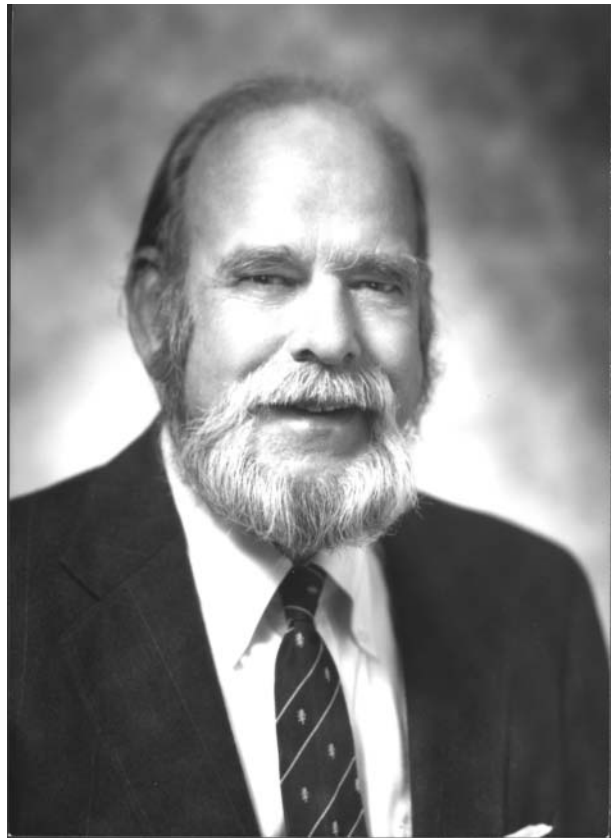
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After attending the Mineralogical Society of America awards luncheon in 2003, my husband Francis R. “Joe” Boyd learned that he would be receiving the prestigious Roebling Medal in 2004. The Roebling Medal, awarded for scientific eminence as represented primarily by publication of outstanding original research in mineralogy, is an honor that appropriately caps a lifetime of achievement in the geological sciences. On hearing that he would be the next recipient, Joe expressed joy, gratitude to the Mineralogical Society of America, and humility at such an honor. I know that if he were here to receive the award, he would emphasize his thankfulness to all of the friends and colleagues who made his career in science meaningful. Especially, he would want to thank Steve Haggerty, a longtime colleague and friend, for his generous and thoughtful citation.

Joe enjoyed a life-long love of science. As a child growing up in Cambridge, Massachusetts, he set up a museum in his home to exhibit his collection of rocks and minerals, as well as certain living specimens that interested him. His mother, a genteel lady from South Carolina, patiently put up with her guests of snakes, insects, and the occasional furry creature. Joe’s father, an attorney, instilled in him a love of learning and hard work, and was supportive of his decision to pursue a scientific career. Joe kept one souvenir of his early school years, a grade school report in which his teacher criticized his writing and spelling but went on to praise his work in science class.

Joe attended Milton Academy in Massachusetts, where he continued to excel in science. He was also a strong athlete who enjoyed outdoor sports. So it was natural for him to choose a major in geology at Harvard College. During summers he contributed to the war effort by working in the Charleston Naval Yard. After graduation he moved west to pursue an interest in petroleum geology at Stanford, but decided that stratigraphic formations were not for him and returned to Harvard where he completed another M.S. degree and his Ph.D. under George C. Kennedy. He often spoke about his graduate years at Harvard as an “exciting experience that provided [him] with insights and stimulation that have been sustaining,” especially because of the intellectual climate generated by his professors and fellow students. He maintained a strong bond with these fellow geologists and counted them among his life-long friends.

George Kennedy, Joe’s dissertation advisor, had grown up on a ranch in Montana’s Centennial Valley, and this surely influenced Joe’s decision to work on the geology of the nearby Yellowstone rhyolite plateau, and its pyroclastic flows and welded tuffs. Field work in and around Yellowstone in the early 1950s was challenging and usually conducted on horseback. His field experiences became the subject of many great stories featuring obstreperous bears, raging streams, and the challenge of living off the land



by hunting and fishing. His colleague and friend, Bob Schmaltz, described fieldwork with Joe as follows:

“I remember camping on the Snake River under rather primitive conditions and waking after a particularly miserable night to find that Joe had awakened early, started some bacon cooking and then had caught and cleaned several trout for breakfast. By the time I had coffee started, he had the trout cooking in bacon fat and the day had become cheerful, despite our soaking clothes, the continuing downpour, and the prospect of a long walk in the rain with heavy packs. Sure, he loved to fish, but this was a gesture to make a miserable situation not just tolerable, but almost a celebration.”

Joe was quite amused a few years ago by the 1998 IMAX film about Yellowstone history and geology that included scenes where an actor impersonated him doing fieldwork. He had re-

viewed the script for scientific accuracy, but hadn't realized until the film's release that his character would be driving a battered early model Ford and be accompanied by an attractive female field assistant.

While a graduate student, Joe began conducting high-pressure laboratory experiments, in Kennedy's Lab. The desire to continue this work enticed him to the Geophysical Laboratory, where he became a research assistant to George Morey. Joe's first task in Morey's laboratory was to measure the optical properties of synthetic phosphates. Seeking a more creative outlet, Joe assembled a hydrothermal apparatus from bits and pieces of surplus equipment in his spare time. There was no free table space in the crowded lab, so Joe nailed his apparatus to the windowsill. He subsequently carried out what he believed to be the first synthesis of dolomite. Unfortunately, he later discovered that Julian Goldsmith at the University of Chicago had beaten him to it shortly before.

In 1955, Phil Abelson, then director of the Lab, was sufficiently impressed with Joe's work to take him off phosphate duty and offer him a laboratory of his own. Joe remained a Carnegie staff member for the rest of his life, continuing his research there after his retirement in 1996.

Initially Joe worked on the stability relations of amphiboles, but soon began experiments exploring the origins and conditions of crystallization of deep crustal and mantle material. With Joe England, he designed and developed devices for conducting experiments at high pressures. The Boyd-England piston cylinder, high-pressure apparatus has since become a vital tool for a generation of experimental petrologists in laboratories all over the world.

Joe's keen curiosity expressed itself not only in his vigorous scientific pursuits but also in travel to remote destinations. When he learned that the Carnegie Institution was sending a team of physicists and astronomers to the high Andes as part of the First International Geophysical Year in 1957, he convinced the Institution that a geologist was needed to complete the expedition. The team achieved its scientific goals, and the experience provided Joe with more remarkable stories and a high regard for the people of the Alto Plano.

By the mid 1960s Joe had launched his influential interpretation of the Earth's mantle with a comprehensive study of kimberlite xenocrysts of subcalcic diopside that had been collected by Peter Nixon in Lesotho. This marked the beginning of a long and productive collaboration and friendship. Joe arrived at the First International Kimberlite Conference in South Africa in 1973 with important papers describing the results of over 600 microprobe analyses of the Lesotho samples.

During the 1960s and 1970s, Joe also made significant contributions to the Apollo 11 Lunar sample program, but he devoted most of his research to the examination of upper mantle and deep crustal rocks in southern Africa and, later, in Siberia. These studies led to the first detailed description of the root of southern Africa's ancient Kaapvaal craton, as well as to the development of experimentally calibrated thermobarometry at

mantle conditions. In 1974, shortly after his 48th birthday, Joe was elected to the National Academy of Science.

In 1976, Joe partnered with Henry Meyer to organize the 2<sup>nd</sup> International Kimberlite Conference in the southwestern U.S. Joe remained a vital force at all the subsequent conferences.

Peter Nixon and Graham Pearson described Joe at the last Kimberlite Conference in 2003 as follows:

“Joe gave his final, but characteristically lucid and informative lecture standing square to us, the audience—no notes, no Powerpoint—just a presence on stage telling us how it is. . . Namibian lithosphere used to have diamondiferous roots but they were delaminated prior to kimberlite eruption—wow”!<sup>1</sup>

Joe contributed a prodigious body of work to advance our understanding of mantle petrology through the combination of astute field observations, precise laboratory studies and creative high-pressure experiments. That, along with his generosity toward fellow geoscientists, leaves a remarkable legacy.

Joe loved life and counted himself blessed by his choice of profession and his career-long association with the Geophysical Lab. He delighted in outdoor activities and would literally go to the end of the Earth for field studies. He loved to ski and was among the few greats who conquered Tuckerman's Ravine in New Hampshire's White Mountains. Joe was undaunted by the difficulty of hiking up to the head of the ravine before making the precarious descent. Joe was also an avid sailor, particularly excelling in Jet 14 races on the Potomac River. In later years he enjoyed hiking coupled with bird watching.

Joe loved gardening and any plant he nurtured would thrive, including his extraordinary orchid collection. Finally, I have to mention how much he enjoyed music. Sounds of jazz or classical music filled our home every day. He was a devoted opera fan, and for many years attended each opening night at the Washington Opera looking splendid in his tuxedo.

I wish I could individually thank each of the many collaborators and friends who helped make Joe's accomplishments not only possible but a pleasure for him. I'm sure you know that Joe was always grateful for these associations. I also extend heartfelt thanks to our wonderful family and many dear friends, not only for being here today but also for their continued support and love during this past difficult year.

I will end with Joe's own words. In 1997, he wrote in the 50<sup>th</sup> Anniversary Report of his Harvard Class “I have somewhere read that young people have the face they were born with and old people have the face they deserve. I don't know what I deserve but what I have had mainly is a VERY good life.”

Thank you for inviting me to speak on behalf of my husband, Joe Boyd, and thank you for your time and kind attention.

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<sup>1</sup>Nixon, P.H. and Pearson, D.G. (2004) Memorial for Francis R. “Joe” Boyd. *American Mineralogist*, 89, pages 1835–1837.