

## Presentation of the Distinguished Public Service Medal for 1994 to Konrad Bates Krauskopf

GORDON E. BROWN, JR.

Department of Geological and Environmental Sciences, Stanford University, Stanford, California 94305, U.S.A.

I am honored that Konrad Krauskopf asked me to serve as his citationist for the 1994 Mineralogical Society of America Distinguished Public Service Medal. I have known of Konnie since I was an undergraduate student, but we didn't meet until 1972 during my interview trip to Stanford University. I was somewhat in awe of Konnie when I first met him. He took me on a brief field trip to the Coast Range west of Stanford, which helped convince me that I should leave the relatively flat and geologically uninteresting surroundings of Princeton, New Jersey, for the geologically spectacular and earthquake-prone Bay Area. After 22 years as his Stanford colleague and friend, I am still in awe of Konnie because of his accomplishments, his work ethic, and his distinguished service to the public, for which he is receiving this medal.

Konnie was born in Madison, Wisconsin, in 1910, the son of a chemistry professor at the University of Wisconsin. He grew up there and received his A.B. degree in chemistry at the University of Wisconsin, Madison, in 1931. While at Wisconsin, Konnie took a course from William Twenhofel, which sparked his interest in geology. However, the spark wasn't quite strong enough to cause Konnie to deviate from his path in pure chemistry, at least not at that time. He attended the University of California at Berkeley for graduate study in chemistry and received his Ph.D. degree in 1934. Konnie's timing in completing his Ph.D. was rather poor, as the Depression was still affecting the job market in the U.S. in 1934. His professors at Berkeley recommended him for a one-year instructor position there in 1934–1935, which he gladly accepted. Still in need of a job in 1935, Konnie traveled down to the Farm, also known as Stanford University, to talk with professors in the chemistry and geology departments about an instructorship. Konnie told me that his meeting with Aaron Waters of the geology department was far more exciting than a meeting with chemistry professors, so he decided to matriculate into the Ph.D. program in geology and worked with Professor Waters on the geology of the Okanogan Valley in north central Washington. He also admitted to me that continuing to do bench chemistry was far less interesting to him than the field work that geological studies permit. At the same time, Konnie convinced Professor Swain, a well-known chemist who was head of the physical sciences program at Stanford, that he would make a competent instructor of an undergraduate physical science course that combined his expertise in chemistry with his newfound interest in geology. So Konnie served in this capacity while also working toward his Ph.D. in geology, which he com-

pleted in 1939. During this period, Konnie married Kathryn McCune, better known as Kay. Kay spent a fair amount of time in the field with Konnie during his early mapping forays. She was often kept waiting by Konnie at designated meeting places. Many of us know about keeping our spouses waiting, so we should overlook this one minor problem in Konnie's otherwise illustrious career.

His experience as a physical science instructor would have a far-reaching effect on Konnie's career path, including his first major public service, because in 1941 Konnie published his first textbook entitled *Fundamentals of Physical Science*. The sixth edition of this book, co-authored by physicist Arthur Beiser, was published in 1974. It sold roughly 4000 copies a year from 1941 to 1960 and was used mostly in junior colleges in courses designed for nonscience majors. Konnie teamed up with Arthur Beiser again in 1960 to produce another classic textbook entitled *The Physical Universe*, now in its seventh edition (1992). This book has been translated into Spanish and sold 17000 copies in 1992 alone. It is widely used in junior colleges throughout the U.S. I recommend that each of you buy a copy of *The Physical Universe* and read it. This text is an excellent example of how to write a book that is easily readable by a layperson but doesn't sacrifice scientific accuracy and rigor. Such a book can be enjoyed by the most hardened fuzzy, as we refer to humanists at Stanford, as well as the most knowledgeable techy. I can think of few things a distinguished scientist can do that better serve the public interest than educating the masses about the beauty, complexities, history, and logic of scientific discoveries. This accomplishment alone is worth many public service awards.

Another episode in Konnie's life centers around his research and teaching career at Stanford University. He has clearly distinguished himself scientifically with a number of seminal contributions to the emerging field of geochemistry, including the controls of trace-element concentrations in sea water, the solubility of silica, and the transport of metals in ore-forming solutions. When Konnie first began his teaching career in 1939, the term geochemistry was just beginning to be used. Konnie, along with others, helped combine the concepts of physical chemistry with those of geology into a field that is now called geochemistry. His book *Introduction to Geochemistry*, just published in its third edition (1994) with co-author Dennis Bird, is another model of how a textbook should be written. Many of us have benefited from the clear explanations of geochemical processes in the first two editions (1967 and 1979) of this classic text.

But that's not all! Konnie has also managed to find the time to write several other widely used books, including *The Third Planet* (1974), *Introduction to Physics and Chemistry* (1970, with Arthur Beiser), and *Radioactive Waste Disposal and Geology* (1988). Each of these books represents a significant public service because of the number of people who have learned from them. A quote from one of the letters nominating Konnie for this award sums up the value of Konnie's textbooks rather well: "These texts individually ought to be sufficient to raise an author to hero status in terms of service to the physical sciences education community."

During his tenure as a professor at Stanford, Konnie stopped out briefly to serve his country, as Chief of the G-2 Geographic Section, U.S. Army, Tokyo, from 1947 to 1949. According to Kay Krauskopf, Konnie treasured the one-on-one meetings with his commanding officer, General George Willoughby, who taught Konnie much of what he knows about geology. Kay and Konnie managed to raise four children during this period as well, which constitutes another public service because the kids turned into very productive members of society. Karen Hyde is a homemaker, Frances Conley is a leading neurosurgeon at Stanford University, Karl is an architect, and Marion Foerster is a library science instructor in a state college in Southern California.

Konnie Krauskopf has served his profession extremely well and has earned several professional kudos and awards besides the one being presented to him today. He has served as President of the American Geological Institute (1964), the Geological Society of America (1967), and the Geochemical Society (1970), and has been awarded the Day Medal of GSA (1961), the Goldschmidt Medal of the Geochemical Society (1982), and the Ian Campbell Medal of the AGI (1984). He also has been elected to membership in the National Academy of Sciences and the American Philosophical Society. As a distinguished geochemist and earth scientist, Konnie has been invited to present lectures in a number of universities around the world. During NSF and Fulbright Fellowships in Germany and France, respectively, Konnie gave a series of lectures in German and French. According to Kay, Konnie learned French vocabulary by taping vocabulary lists to the bathroom mirror and reading them in the morning while he shaved. Kay still doesn't understand how Konnie managed to learn enough Portuguese to give lectures in this language during a summer course he offered at the University of Bahia in Salvador, Brazil.

Most recently, Konnie Krauskopf has distinguished himself in another area of public service and one that is very important to the nation. He has served for more than ten years as a member and then head of the National Academy of Sciences/National Research Council Board on Radioactive Waste Management and "was influential in putting together an outstanding Academy report (1988), serving national need in this critical, contentious area," to quote a nominator's letter. His book on *Radioactive*

*Waste Disposal and Geology* is typical of his other books—a model of scientific clarity and authority that can be understood and enjoyed by a layperson.

Now for a few personal observations that poke a little fun at my humble and accomplished friend. He can out-walk almost anyone in the field and is part mountain goat and part marathon runner. I have trailed behind him on several field trips and hikes. Konnie has a penchant for falling asleep during lectures, not his own but those by visiting speakers, a penchant also shared by another distinguished colleague of mine, Gary Ernst. Yet, when the lecture is over, Konnie often asks the most penetrating question from the audience. I think he is just resting his eyes during these periods of head nodding. Konnie also has a love-hate relationship (mostly hate) with computers. When he started working on the third edition of his book *Introduction to Geochemistry* with Dennis Bird some four years ago, I was chair of the Department of Geology at Stanford and approved the purchase of a Macintosh computer for Konnie so that he and Dennis could revise the book more efficiently. Reluctantly, Konnie learned how to use a word-processing program, but he didn't like to use it. On several occasions, according to Dennis, Konnie would retype sections of chapters on an old Remington typewriter, perfectly, rather than use his new Macintosh. Dennis would then have to enter the new text into the computer, and they would proceed on in this strange way with their writing and revisions. I gained additional insight about Konnie by reading a short essay he wrote about his adventures with a mule named Annie during field work near Spanish Lake in the Sierra Nevada. This essay was secretly loaned to me by Kay Krauskopf and is entitled "Nine Days with Annie." It chronicles Konnie's unsuccessful efforts to convince a female mule to cooperate. A quote from this story is worth repeating here because it shows another side to Konnie. "Liberal use of the switch got us back on the trail and headed in the proper direction. But another clear space appeared soon, and the same maneuver was repeated this time with more guile on Annie's part and a much closer approach to success. We ended up, hot and out of breath, in a tangle of manzanita. I began to understand why it is so soul-satisfying to swear at mules. Annie turned her disarming brown eyes upon me, but I suppose she was doing a bit of swearing herself. Meekly I threw away the switch and picked up the lead rope. Annie had won that round unconditionally." Konnie has displayed the same type of patience and understanding toward his students and colleagues during his distinguished career, using an occasional "verbal switch" and gentle cajoling to spur them into action. This excerpt also illustrates his abundant common sense.

Mr. President, fellows, members, ladies, and gentlemen, it is with great pleasure that I present to you my friend and colleague, Konnie Krauskopf, the Mineralogical Society of America's Distinguished Public Service Medalist for 1994.