

Acceptance of the Mineralogical Society of America Award for 1995

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Thank you, Mr. President, and thank you, Eric, for the very nice introduction. I certainly appreciate your exaggerations on my behalf. It is a great pleasure to be here today. It gives me the opportunity to acknowledge the many people who have made my career, thus far, productive and also truly enjoyable. I want to start by thanking the Mineralogical Society of America and the Awards committee. It means a great deal to me to receive this award today, particularly because of the fact that I live overseas. It truly came as a great surprise. Thank you very much.

I started my graduate education at the University of Michigan, where I had the great fortune to work with a truly dynamic duo—Bill Kelly and Eric Essene. Both of these scientists share a common scientific philosophy, namely to conduct science of the highest quality using all the tools at their disposal. The success of this philosophy is apparent in their publications, certainly some of the best in their respective fields. Interestingly, their styles of research are completely different. Bill is methodical, extremely well organized, neat, and pays meticulous attention to detail. Eric on the other hand . . . well, thinking of Eric's desk, the phrase "angle of repose" comes to mind. Working with Bill and Eric, I learned a great deal about how to approach a scientific problem. I also hoped that I would develop work habits somewhere between these two extremes. Unfortunately, my desk looks frightfully like Eric's.

I continued my Ph.D. studies working with Eric. I can't say that Eric was a perfect advisor. After all, he would make me play darts with him even though I could never beat him. But other than that, he is pretty much all a graduate student could ask for. He is always there to help with a difficult problem, is very supportive, and is a lot of fun to work with. Eric has an unbelievably broad knowledge, not just of metamorphic petrology and geochemistry, but of geology and science in general. I could have easily spent all my time as a Ph.D. student working with just Eric, but he demanded more of his students. He encouraged us to work in other laboratories throughout the country. Perhaps he was just trying to get rid of us, but I think that more likely he wanted us to experience the philosophies of other institutions. Toward this end, I benefited greatly from working with John Bowman at the University of Utah, Steve Bohlen, then at SUNY Stony Brook, and Bob Hazen and Larry Finger at the Geophysical Laboratory. Finally, I worked in the laboratory of Jim O'Neil, then at the U.S. Geological Survey in Menlo Park.



Working with Jim was a turning point in my career. Jim is a walking encyclopedia of stable isotope geochemistry, and discussions with Jim are always fascinating and entertaining. His enthusiasm caused me to switch to the field of stable isotope geochemistry. Since our first meeting, we have had many profitable collaborations, and Jim has become a very special friend. I know that our scientific collaborations and friendship will last for many years to come.

I would like to thank three other people from my Michigan days. George Helffrich and Mike Cosca, who each spent two summers with me as my field assistants, selflessly mapping and carrying backpacks full of rocks. (Of course, to put it in perspective, it should be noted that the fishing in the Wind River Range is as good as any in the United States.) I also want to thank David Moecher, an office mate and fellow warrior in the battle to win Ph.D.s. David was always there for support, as a sounding board for my scientific ideas and as a good friend.

After finishing my Ph.D., I continued with a postdoc at the Geophysical Laboratory. The Geophysical Lab is a wonderful place for a young postdoc. For me it was a new and wonderful experience to work in a place where

young scientists are given so much freedom and independence to conduct their research. This atmosphere was no doubt encouraged by Charlie Prewitt, the Director, as a continuation of the policies of his predecessor, Hat Yoder and the entire staff at the Geophysical Laboratory. My sponsor was Doug Rumble, whose trust in my abilities was manifest in his throwing open the doors of his laboratory for me to carry out my science. It may have helped that he spent much of the time in the Himalayas, so he was unaware of the mad science that was going on there. Had he been around, no doubt the lab would have been a much safer place to work. Someone who had no problems with my mad science was Tom Hoering. He saw nothing wrong with shooting a 4000 °C laser beam into a sample chamber filled with jet rocket fuel. Of course, now that I think of it, Tom wasn't around when I made the initial tests! It is safe to say that Tom knew as much or more about stable isotope laboratory techniques than anyone in the world. I was fortunate to have many discussions with preeminent scientists in my field who patiently explained to me why the laser technique couldn't work. Tom not only believed that the laser system could work, he knew that it would work. He was so confident in the project that he actually laid out a timetable for my success in an informal, seemingly inconsequential conversation. That conversation, and Tom's confidence in my work, kept me going during some discouraging times. Tom was always there when I needed advice, and I am only sorry that he could not be here today to learn how much I appreciate all he had done.

After some initial, encouraging results with an Nd-YAG laser, I was awarded NSF funds to purchase a CO₂ laser. Unfortunately, the laser and peripherals arrived only three weeks before I was to leave for my new post in Switzerland. This seemed like enough time to build the system and make the initial tests. Unfortunately, the work was complicated by the fact that I was spending my days at the U.S. Geological Survey preparing gas standards for my new laboratory. But there were still nights. On my first day at the U.S. Geological Survey I met a young scientist, Tim Johnson, who was intrigued by what I was doing and offered to help me construct the extraction line. So that night, after a pleasant dinner, we arrived at the Geophysical Lab at around 8:00 p.m. only to find that Potomac Electric had cut the electricity to the building

for the next three days. Normally, even I could wait for a few days, but with the three-week deadline, this was a crisis. We were devastated . . . until we realized that we didn't need electricity to blow glass and construct the line! We ran to the nearest 7-11 and bought a couple of flashlights. That first night, and for most of the rest of the week, we worked until 3:00 in the morning, one of us holding the flashlight and the other doing the glass blowing. These few days were very memorable, and by the end of the week we had finished.

Jim O'Neil flew down from Michigan that weekend for our initial test. Saturday morning we loaded seven international quartz standards. All seven samples gave the correct answer, and as we broke for lunch we realized that we had just demonstrated the success of a new technique, and that we had analyzed samples far smaller than had ever been attempted before. It was a very memorable time, one that I'm sure none of us will forget. Since then, there has been a great deal of support for this work, and other scientists around the world have built similar systems. Many wonderful improvements have been made since that first day. I personally owe a great deal to my colleagues at the Université de Lausanne, particularly Johannes Hunziker, Mike Cosca, and David Kirschner.

Finally, I would like to thank three additional people for all they have done for me. First, my wife, Sharon, who has been with me since before I first started studying geology. Fortunately, Sharon is not a geologist, but nevertheless, she has had a tremendous influence on my career. She has always supported me in good times and bad, and has always supplied a great deal of inspiration. She has been my guardian and defender for all these years. And last, and least in size, but not importance, are my two daughters, Chloé and Alana. Their full-time job is to ensure that I do as little work as possible. It is so nice to have a fan club of two daughters who are so proud to have a daddy who goes out and digs up rocks, instead of doing something boring like . . . neurosurgery. I know that if they were here now, they would probably say something like "Come on, Daddy, that's enough already. Get down from there." So taking their advice, I'd like to end there. I want to thank you all for coming today, and to the Mineralogical Society of America, again, my sincere thanks.