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Acceptance of the Mineralogical Society of America Award for 1989

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This is, of course, a very happy moment for me. To receive the recognition of respected professional colleagues is about the greatest reward that one can hope for in science, and I feel greatly honored to have been selected for the MSA award. It is a reflection of the openness of this society that someone from beyond the shores of the United States can be considered. In return I can only say that in Europe there is a large fund of respect and goodwill for MSA. Many of us who have been fortunate enough to spend part of our careers here like to think of ourselves as very much a part of the society, making contributions and being involved whenever we can.

I have to admit I am really here only by accident, or more accurately, by a series of accidents. If history had been different, I might well have ended up in the British Colonial Service like my father. I was born in Tanganyika, now Tanzania, and my family only returned to England after Tanganyika became independent in 1960. Back at school in England I became interested in science, and I thought I would like to become an industrial chemist. One year of undergraduate chemistry was sufficient to make me change my mind, however. Undergraduates reading Natural Sciences in Cambridge all have to take three science subjects in their first year, and I had taken geology to fill in between what I thought of as more serious sciences. I knew nothing at all about geology but was surprised to discover how interesting it was and so decided to continue with it. In my final year as an undergraduate I once again found that I needed some kind of soft option to fill in my timetable, and I settled on a mineralogy course given by Desmond McConnell. Little did I realize what I was letting myself in for. Desmond's course in those days contained now-familiar themes of order-disorder and exsolution processes in minerals, kinetics and mechanisms of phase transitions, electron microscopy and enough intuitive ideas about how minerals work to fill several research careers. It was by far the most stimulating course I took as an undergraduate, and when by chance Desmond then had a vacant Ph.D. place with no applicants, I decided to stay on to do research.

I only began to think seriously about a career in scientific research during the first year of my Ph.D. work. Andrew Putnis was also one of Desmond's students, and the way that everything he did on phase transitions in sulfides generated new insights into equilibrium and nonequilibrium behavior made a great impression on me. Also, Charlie Prewitt and Bob Hazen were visiting Cambridge that year, and they made me aware of the wider world. Later, when the opportunity to go to Harvard arose, I jumped at it.

My two post-doctoral years working in Charlie Burnham's lab were the happiest of my career so far. Anyone who has worked with Charlie will know what it was like—you are encouraged to follow up on new ideas without restraint, but you are kept on a rigorous scientific path. When I was back at Harvard this summer I went to see if Charlie's little X-ray darkroom had been moved. Fortunately it had not, and the original list of dates and initials showing when and by whom the chemicals were last changed is still in use—it represents an impressive record of the positive influence that Charlie has had on many people over the years. Ahead of me were Dave Bish, Linda Pinckney, Tim Grove, and Dave Veblen, and there are also dates corresponding to the era of Bob Hazen and Joe Smyth. I used to take quiet pleasure in refilling the developer and fixer tanks and then signing the list in the hope that some of their distinction might rub off on me.

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When I returned to Cambridge, Desmond McConnell had organized with Alex Navrotsky that I should visit ASU and start making some calorimetric measurements relating to Al/Si ordering processes in cordierite and plagioclase feldspars. Again, this was a turn of good fortune for me, as I moved into a fresh environment with new friends to make and new ideas to absorb. Alex's lab was also a demanding place, though in a different kind of way. I soon discovered what it takes to do calorimetry; basically you have to be slightly crazy! All calorimeters have personalities of their own, and their main aim seems to be to generate frustration and anxiety. The fascination of slowly accumulating quantitative measurements of mineral stabilities is irresistible, however, and becomes addictive. It is typical of Alex's generosity that she later helped me to set up a calorimeter in Cambridge, though it is not half as much fun to sit in my lab during a dreary English winter as it was to fly out to sunshine and the Arizona desert. Two of my trips out there also coincided with spring training before the official baseball season began, and I spent many hours sitting in the sun watching baseball while waiting for the calorimeter to equilibrate.

At the NATO feldspar conference in 1983 I met Ekhard Salje, who was then based in Hanover. I have been busy trying to learn about Landau theory from him ever since. Cambridge has been transformed since he moved there in 1985, and it is a great place to be at the moment. Ekhard shares his knowledge of theoretical and experimental solid-state physics freely, and we are having a wonderful time applying his ideas to the natural mineral systems that we have been brought up with. In this context the Prewitt philosophy of science seems pertinent. I don't know if Charlie still believes in it, but when he was in Cambridge in 1976 he used to say that the healthiest state of a science or a scientific department was when it was splitting up to follow diverse leads into other sciences or when it was recombining to focus back on a central theme. Mineralogy seems to be at the former stage at the moment. There are so many new experimental techniques available to us, while new theories from physics and chemistry are more accessible than they have ever been. I know that some of our geological colleagues sometimes think that we have less and less to say to them, but that will change when we come back on the return cycle. What we can recognize now is that the expertise for characterizing processes in many types of materials lies largely in the hands of crystallographers and mineralogists and that minerals represent an important resource, not just in traditional economic terms, but also for pure and applied science. I feel sure that, during the next ten years, solid-state science in general will be influenced by the kind of research that is going on in the earth sciences community.

To have a career in science it is necessary to have opportunities, and I seem to have been given more than my fair share of those. The MSA award will create new opportunities for me, for which I am most grateful. I only hope that I will be able to justify them.