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Presentation of the Roebling Medal for 2003 of the Mineralogical Society of America to Charles T. Prewitt

ALEXANDRA NAVROTSKY

University of California-Davis, NEAT ORU & Thermochemistry Facility, Davis, California 95616-8779, U.S.A.

It is an honor and a pleasure to introduce Charles T. Prewitt as recipient of the Mineralogical Society of America's highest honor, the Roebling Medal. Mineralogist, crystallographer, solid state chemist, organizer, leader, mentor, educator, colleague, friend—he excels in both professional and human attributes. Most of you know Charlie. Those few who do not know him know the Shannon and Prewitt tables of radii. But do you know that those were created not by university professors but by industrial scientists? Charlie Prewitt's career has had several stages: Ph.D. at MIT, years in the DuPont Central Research Laboratory in Delaware, followed by roughly a decade at the then new university at Stony Brook, then another decade as Director of the Geophysical Laboratory of the Carnegie Institution of Washington, now private citizen, crystallographer, mineralogist, solid state chemist in Arizona. The hallmarks of his career are science and service. These are inseparable.

In the 1970s and early 1980s, Prewitt's group made full use of the new automated four-circle single-crystal diffractometer, an instrument that changed crystallography from an esoteric and tedious profession to a versatile tool in the understanding of structure and bonding. Comparative crystal chemistry emerged. Not only could crystal structures be determined rapidly and accurately, but their variation with pressure, temperature, and composition provided insight into the microscopic basis of phase stability. Prewitt's group focused on the major rock forming minerals: silicates, oxides, sulfides. A new generation of collaborators launched illustrious careers of their own under Charlie's mentorship: Bob Hazen, Larry Finger, John Parise, to name a few.

In the 1980s, Prewitt became central to two major developments that have changed the course of mineralogy and defined the field of mineral physics. The first was the application of synchrotron radiation to mineralogical crystallography. The second was high-pressure research using both multianvil and diamond anvil cell technology. Combined, these two advances increased sensitivity and accuracy of structure determination, allowed much smaller crystals to be studied, and opened a window on the depths of the Earth, especially the mineralogy of the mantle. Synchrotron and high pressure research was and is intrinsically interdisciplinary teamwork. Charlie helped organize the U.S. mineral physics community and develop synchrotron facilities at Brookhaven and, later, at Argonne. He also forged collaborations and deep friendships with many scientists in Japan: Akimoto, Sueno,Yagi, Syono, Ito, Sasaki, Kudoh, Yamanaka—the list goes on and on. The Stony Brook group, Prewitt, Weidner, Liebermann, was poised to make a major leap in American high-pressure research.

Then Charlie moved to the Geophysical Lab. Instead of slowing that impending leap, the move accelerated it, bringing the groups in Stony Brook and Washington into collaboration. By then I had moved from Arizona to Princeton, and central New Jersey was a good stopping point in the rather nasty Washington – Long Island car trip, and our calormetry added another dimension to the science. ChIPR, the NSF Science and Technology Center for High Pressure Research, was born. It had a wonderful 11 year run and is now succeeded by COMPRES. Charlie and the rest of us are very proud of what ChIPR accomplished, but we are equally proud of the fact that, after eleven years of working together, our Executive Committee members (Weidner, Liebermann, Prewitt, Navrotsky) are even better friends than at the beginning. We have a tradition of a dimsum brunch at Fall AGU.

Prewitt made a major contribution to mineral physics by his crystallographic study of hydrous high-pressure phases. These materials, synthesized at pressures over 100 kilobars, are a veritable alphabet soup: phases A, B, shy-B, D, E, and numerous others. Their discovery negated the hope that, at mantle pressures, only simple structures like spinel and perovskite, needed to be considered. The work of Prewitt and coworkers creates structural principles for these materials. Their importance as reservoirs for water in the mantle is still being investigated.

Let me now turn to Charlie, the person, by relating several fond memories. I visited Stony Brook in 1981 for two weeks. The Prewitts made me feel at home and arranged a wonderful picnic on Shelter Island (where Charlie was very active in the Nature Conservancy). New York State was having one of its periodic fiscal crises and battles, and my travel payment was in "scrip" rather than a regular check. Charlie took me to a local bank immediately to cash it, fearing that the banks might stop honoring the scrip. In 1982-83, we had some loose sabbatical money at Arizona State, and we were able to invite Jerry Gibbs and family for one semester and Charlie Prewitt and family for another. We spent many happy Sundays in the desert and mountains together. Science and scenery go well together. Charlie's and Gretchen's love of Arizona was kindled then.

I remember a CHiPR executive committee meeting in New York City in the early 1990s. It was somewhat contentious, with strategic choices to be made. After it, we all felt exhausted, but still had an hour before our trains departed. I suggested we go up to the top of the Empire State Building, and, as soon as we were on the viewing platform, all of us, but especially Charlie,

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cheered up and enjoyed being young-at-heart tourists. Friendship and rationality triumphed; wise choices were made.

Charlie has served our community selflessly over many years. On MSA Council, as Vice President, President, and Past President of MSA, as representative on national and national committees, as founding Editor of Physics and Chemistry of Minerals, as reviewer, he has been conscientious, efficient, and generous. We continue to call on him for his attention to detail, his general wisdom, and that most uncommon commodity, common sense.

I am proud to have been associated with Charles T. Prewitt for most of my career. His splendid science and his quiet leadership and unfailing human kindness inspire us all. Congratulations, Charlie, on winning the Roebling Medal.