since been much less free with the red X's, and would be greatly pleased if the victim of that early one would come forth, be identified, and accept my apologies.

There are others to whom special thanks are due. I wish especially to mention three: to John Rosenfeld, whose interest in rocks and minerals began at the same time and place that mine did, for the long hours, through the years, of productive give and take. To David Waldbaum for more than a decade of happy symbiosis. We were fascinated by the same problems, and found that what one enjoyed most was what the other enjoyed least in our efforts toward their solution. To my wife, Eleanora, for those many things in our lives that, though part of the whole, are *not* of direct concern to the proceedings of this Society!

I have heard it said, or implied, that the work of mineralogy and petrology, studying the substance of the earth beneath, is largely done, and that bright young scientists would be well-advised to apply their talents to the "purer" aspects of physics and chemistry. There have even been, as some of you may know, a few formal pronouncements to this effect. To me this is a profound and shocking error. God's laboratory, Nature, is not run by the same rules as those in chemistry and physics departments, and would never, I am sure, gain the approval of an inspection team from OSHA. The records, furthermore, are in dreadful shape—but this is what makes it so fascinating. Mineral crystals are among the most varied and complex known. They are related to many of the substances studied by our purer colleagues in much the way that the strokes of an artist are related to straight lines and circles. Our sister sciences have provided us with superb tools and methods of thought, but I suspect that we will be able to provide them with problems as long as the pursuit of knowledge is considered worthwhile.

Let us hope that this will be so for many generations to come.

Thank you.

American Mineralogist, Volume 64, pages 665–666, 1979

Presentation of the Mineralogical Society of America Award for 1978 to J. Stephen Huebner

DAVID B. STEWART

U. S. Geological Survey
Reston, Virginia 22092

President Wyllie, members of the Mineralogical Society of America, and guests:

J. Stephen Huebner has made outstanding contributions to the control of the oxidation state of transition metals in experimental systems of fundamental importance to geochemistry, petrology, and mineralogy. His work is marked by a steady progression in the complexity and importance of the problems he has investigated. His thesis at Johns Hopkins involved determinations of the stabilities of manganese oxides, carbonates, and silicates. Realizing that better thermochemical data were needed, he calibrated the Ni–NiO and MnO–Mn_3O_4 buffers. Publication of a widely-used standard reference on buffer techniques at high pressures followed shortly later. Knowing the importance of careful control of FeO activity for experimental work in silicate melts, he devised original methods of controlling this vital parameter and studied the effects of temperature and pressure gradients and reaction rates in gas-mixing furnaces at one atmosphere. All of these investigations combined to make possible isochemical studies of minerals or magmas containing Fe, Mn, Ti, or Cr.

Of most mineralogical interest are studies of the phase equilibria of pyroxenes, which Steve has pursued with great vigor with Malcolm Ross, Jim Papike, Al Turnock, and Donald Lindsley. These studies concern the partitioning of cations in the pyroxenes below solidus temperatures, where the distributions constitute geothermometers of great promise. Steve and his colleagues have interpreted the cooling histories of lunar ejecta sheets and of terrestrial extrusive and intrusive rocks by use of the results of these studies.

Petrologists know that pyroxenes play important roles in the crystallization of all mafic magmas. Steve has shown that partial melting of pyroxenes in the lunar crust may control the variation of SiO_2 and can

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also be used to determine the depth of origin of the lunar magma. Steve and his colleagues have shown that for both mineralogical and petrological applications, the "dirty" pyroxenes—those containing minor TiO_2, Al_2O_3, and Cr_2O_3—are significantly different in melting temperatures and specific phase relations from the "pure" pyroxenes containing only Fe, Ca, Mg, Si, and O. An investigation by Steve, Bruce Lipin and Toby Wiggins of the partitioning of chromium between silicate crystals and melts under controlled oxidation conditions showed that this minor element sensitively reflects the conditions that exist where magmas are formed, and constitutes a petrogenetic indicator of great promise for lunar, terrestrial, and meteoritic rocks.

Clearly Steve is a catalyst and goad to his colleagues. He leads both by doing his individual research and by coordinating team studies. He is a perceptive critic and editor, and he is enormously gifted in things chemical, physical, mechanical, and electrical.

Steve and his colleagues at the Survey and elsewhere currently are tackling the especially difficult problems of diffusivity in pyroxenes, and along with Al Duba and others have devised procedures to insure that measurements of physical properties of minerals thought to form much of the lunar mantle are made on samples that have been very carefully described as to homogeneity and structure and do not change significantly during the experimental measurements. Estimates of thermal distribution in planetary interiors derived from these measurements thus will be more reliable.

Huebner's contributions do not stop with his science. He has a strong sense of responsibility to all of the organizations with which he is associated. He has taken leadership roles as a project leader, as a principal investigator for lunar pyroxenes, as a member of NASA's Lunar and Planetary Review Panel, and as a member of at least three major Geological Survey committees. He has served his technical societies by assuming particularly time-consuming responsibilities: he was Treasurer of the Geochemical Society, member of the American Geological Institute Governing Board for 3 years, and Secretary/Treasurer of that organization for 2 especially demanding years. He has served the Geological Society of Washington in several capacities, including Secretary for 2 years.

Finally, let me add that Steve is a gentle person who has a fine family and a taste for fine wine and good sailing. He is an outstanding companion mapping in the field.

Mr. President, being personally cognizant of the many talents of J. Stephen Huebner and of his contributions to our science, I am especially honored to present him as the twenty-eighth recipient of the Mineralogical Society of America Award.

American Mineralogist, Volume 64, pages 666–668, 1979

Acceptance of the Mineralogical Society of America Award for 1978

J. STEPHEN HUEBNER

U. S. Geological Survey
Reston, Virginia 22092

Dave Stewart, President Wyllie, Council, Society Members, and Guests:

It is difficult to express my elation and gratitude at being chosen to join the distinguished rank of MSA awardees, which includes both Pete Wyllie and Dave Stewart. I say elation because it expresses my joy when I learned that I had been selected from among other deserving candidates. And I say gratitude because this award recognizes the scientific and professional communities with which I am associated.

One might think, even demand, that the MSA awardee be creative or imaginative. I have had a year to think about today's remarks, yet upon reading the comments of previous awardees, I found I have little new advice or philosophy to offer. It follows that I agree with much of what has been said by my prede-

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