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# ACCEPTANCE OF THE ROEBLING MEDAL OF THE MINERALOGICAL SOCIETY OF AMERICA

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*Mr. President, Professor Frondel, Fellows, Members and Guests of The Mineralogical Society of America:*

The award of the Roebling medal is a great honor, and I accept it with great pride, for this is my own professional society. There are few satisfactions in life which compare with recognition in one's chosen field. At the same time, I wish to express my feeling of humility, for gathered in this room are many mineralogists who put my own knowledge of mineralogy to shame.

I thought that you might be interested in a sketch of the changing complexion of mineralogy as I have observed it. I became a graduate student in geology in 1925, and attended my first meeting of this society when it met in Cambridge in 1932. As I joined this group we argued about the relative importance of crystal habit and internal structure. We continued the discussion at later meetings. It was a sign of the times. Mineralogy was just beginning to change from a descriptive science to the first science to recognize what is now popularly called *the solid state.* From about that period, detailed descriptions of crystal habit began to give way to another kind of description—that of internal arrangement of atoms. This in itself was simply a change from one descriptive science to another, brought about by a change of tool. But the new description of minerals brought with it the power to explain their properties and occurrence, and soon there was a clearer understanding of such things as crystal growth and habit, twinning, plastic deformation, phase transformations, reaction series, and other features of minerals which had been known but not really woven into a science. I was fortunate enough to be one of the youngsters who were on the scene as this development took place, and it was fun taking part in it. There is still a lot to be done, and still a lot of fun to be had.

The importance of crystal structure not only in mineralogy but in chemistry, physics, and metallurgy, made the working out of the arrangements of atoms in crystals a very important matter during this period. This was something of an art, until what is now known as the *phase problem of x-ray crystallography* was appreciated and formulated. Dozens of us became involved in attempts to solve this problem. While a true general solution of the problem has not been achieved, the general nature of its restrictions is now pretty clear, and it can be said that most, if not all, mineral crystal structures can be solved within its restrictions. It is

surprising how many mineral structures are now known, and certainly the science of mineralogy is in a position to advance by taking advantage of the known structures of minerals. I am sure our next great advances will come along theoretical lines, and will include, among other things, a sufficient understanding of the relations of phase diagrams to the structures involved such that at least some phase diagrams can be predicted. We are also on the brink of studying the mineralogy of high pressures, that is, the mineralogy of the deep crust. In another field, we can expect a more thorough understanding of the significance of crystal habit in mineral paragenesis. I hope that I may still participate in the development of some of these inviting subjects.

Returning to the Roebling medal which you have so kindly bestowed upon me, I would like to reiterate how much I value this honor, for it signifies that some of the things which I thought interesting enough to study and to write about, you also thought interesting enough to read about. To a scientist there is no more sincere compliment than to indicate that there is something interesting in what he has done. I deeply appreciate this compliment and will always value this splendid token of it.