

Acceptance of the Roebling Medal of the Mineralogical Society of America for 1980

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Dear Mr. Chairman, dear colleagues:

I am deeply touched with this high honor—awarding me the Roebling Medal of the Mineralogical Society of America. I am particularly touched because some of my works were very much discussed and had many fierce opponents.

I graduated from the Leningrad Mining Institute, where my main teachers were professors A. N. Zavaritskii, V. N. Lodochnikov and A. K. Boldyrev. I started my work as a field geologist with geological mapping in Kazakhstan and Jautia. Later I studied scarns and other mineral deposits. In study of mineral parageneses of Archean rocks of Aldan crystalline massif and the Lake Baikal area, I expressed the idea of differential mobility of chemical components and of the thermodynamic systems with perfectly mobile components to model formation of metamorphic, metasomatic, and magmatic rocks. I considered the application of the phase rule of Gibbs to such open systems and deduced the thermodynamic potentials for such systems. All this follows from the thermodynamics of Willard Gibbs, I supposed, but strangely enough all this has met fierce opposition from many geologists and some physical chemists. My opponents insisted that the phase rule is not applicable to the open systems and that thermodynamics may consider only final states of equilibrium, but not the process by which equilibrium was established. Several public discussions took place with participation of specialists in thermodynamics who approved my approach.

A great encouragement for me was the appearance of the papers of Professor James B. Thompson (Harvard University), who independently communicated analogous ideas.

The study of mineral deposits led me to the development of the theory of metasomatic zoning and of bimetasomatic processes, of acid-base interaction of chemical components in hydrothermal solutions and magmas, and of outstripping waves of acidity in post-



W. G. Ernst presenting award to D. S. Korzhinskii

magmatic processes. My theory of metasomatic zoning also met opposition. One of my critics said: "The formation of sharp fronts of replacement is impossible because it contradicts logic."

I published a set of papers on the problem of transmagmatic fluids of deep crustal origin and their role in magmatic replacement (granitization), ore formation and their interaction with magmas ("metamagmatism"). At the present time, the idea of transmagmatic fluids and metamagmatism has many supporters in the USSR, as well as many opponents.

This reward of the Roebling medal is one of many signs of the friendly relations between American and Soviet scientists. Soviet scientists always receive a very cordial reception in the USA, as well as Americans in the USSR. This international friendship of scientists is very important in our time.