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Presentation of the Mineralogical Society of America Award for 1993 to Lukas P. Baumgartner

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President Navrotsky, guests of the head table, fellow mineralogists:

Lukas Baumgartner has made outstanding contributions in the application of continuum theory to understanding mass transfer in rocks. He has made important observations of paleoporosity and isotopic metasomatism in the Adamello contact metamorphic aureole, and he is currently forging ahead with experimental studies of mineral solubility.

Lukas, by this award the Mineralogical Society recognizes and honors your own research successes. However, this gathering is also a celebration of all our individual and collective achievements as mineralogists, petrologists, and geochemists. Never before have our members enjoyed ready access to such sophisticated and sensitive instruments for mineralogical measurements. Never before have our members attained competence in such powerful theoretical techniques for predicting mineral behavior. And never before has there been such apt application of theory and technique to solving the mysteries of the Earth. So let us not only enjoy the reflected glory of Lukas's achievement but also indulge ourselves in a moment or two of self-congratulation.

Lukas is recognized on the objective basis of his publications, but it is his remarkable personal style of research for which he may be best known in the long run. Lukas combines the deepest physical intuition with superior mathematical skills, the hands of a musician in the laboratory, and a mountaineer's stamina in the field. He has a nose for ferreting out the most fundamental and significant research topics. Lukas, all of us who have been fortunate enough to work with you agree that it is tremendous fun to do science with you. But there is also a teeny bit of pain as long-cherished prejudices and assumptions wither away in the light of your perceptive insights.

Let me recount a couple of anecdotes to convey a more concrete image of Lukas's research style. Lukas arrived at the Geophysical Laboratory in spring 1985 as a predoctoral fellow from the University of Basel, for a three-month visit. Right away things started happening. From Tom Wolery he obtained tapes of the mammoth EQ3-EQ6 mass transfer computer code. An individual who was familiar with the code questioned why Lukas was wasting his time in this fashion because, it was asserted, he would need the entire period of his visit just to get the code working. Actually, when I came in the next morning, Lukas had already started printing out calculations. In another example, Lukas found sharp stable-isotope metasomatic fronts in marble in the contact aureole of the Adamello intrusion. The fronts look like stair steps on a plot of $\delta^{18}O$ or $\delta^{13}C$ (vertically) vs. distance (horizontally). But a problem arose when he began to compute single box fluid-rock ratios. Upstream from the front, where minerals and fluid were fully equilibrated, the ratio is infinite; downstream from the front, where no exchange has occurred, the ratio is zero. These results make no sense in the context of a H_2O flow system. What Lukas did first to solve the problem was to construct a numerical model of many linked single boxes, each exchanging with their upstream and downstream neighbors. This was a bit awkward mathematically, but it was a step closer to reality. Later he developed a more elegant continuum model. But let me emphasize: all this was done while he was conducting a demanding program of isotopic analysis, and all took place within a three-month period. In retrospect, it is clear that he was working at least 36 hours a day: someone should have told him to go home and get some sleep. But, since that would have meant returning to Mrs. Batson's boarding house, perhaps he was better off sleepless at the Geophysical Laboratory.

Friends and colleagues, here is Lukas Baumgartner.

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