

**Zdeněk P. Bažant's Speech in Hofburg, Vienna, on May 11, 2016, accepting the Austrian Cross of Honor for Science and Art 1<sup>st</sup> Class, from Heinz Fischer, the President of Austria**

Mr. President,

Your bestowing on me the exquisite state honor of Austrian Republic fills me with delight and excitement and, after seeing the list of 78 famous recipients since 1955, with a feeling of deep humility. But there are two aspects that I particularly appreciate in this tremendous honor.

One is that I am getting this honor in Austria, a country to which, as a native Czech, I feel a special relation. It is a country of citizenship of all my ancestors. My grandparents have had successful and rewarding careers in the former Österreich-Ungarn and I remember how they cherished their memories from it. After defecting from communism, sentenced in absentia to prison in my native land, I loved visiting Vienna because it felt here almost like in Prague. I feel I have tremendously benefited from my four-decades long association with Austrian engineering scientists.

Second, I do not recognize among the previous recipients any engineers, and so I wonder whether my case might begin a trend, a trend of inclusion of engineering science. I subscribe to the

epistemological views of the logical positivists, for example Thomas Khun. Science should be grounded in observation and should serve a useful purpose, which is the purpose of engineering science. The formulation of scientific hypotheses should be marked by a quest for simplicity (known as Occam's razor), and this is exactly the mission of engineers. As pointed out by the Austrian-British philosopher Karl Popper, science must be tested, which often means, applied, and this is what engineers do. One prominent example is the career of Theodor von Karman, an American-Austrian scientist who received his education in engineering in Österreich-Ungarn, in Budapest. Many think that, for his eternally useful theories of turbulence, post-buckling, etc., this engineer should have received a Nobel Prize. He is often cited for saying that the scientists explain in their theories what is, but it is the engineers who create what has never been. Many in America believe that science and engineering should be one. That is why we have a Section of Engineering Science in our National Academy of Sciences, and why we have a thriving society with this goal, the Society of Engineering Science, a society with which I have had a long and rewarding association. Of course, not all engineering is science, but the engineering science is.

Mr. President: Please accept my expression of the deepest gratitude for this exquisite honor, the Austrian Cross.