

Foreword by Wm. A. Wulf, PhD
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In his well known 1959 lecture *The Two Cultures*, C.P. Snow—who was educated as a physicist but whose vocation was as a novelist—worried about the divergence of the "science culture" from the more traditional humanistic one. Himself part of both cultures, he felt that their respective members were no longer able to communicate, and mused on the loss to society as a consequence. I have often thought that this failure of communication was, as often as not, about what the cultures share rather than how they differ. It is wonderful to present the work of Michael Schultheis that speaks so clearly to both cultures about what they share.

I look at this work as an engineer, of course, and the essence of engineering is design under constraint—that is, our designs are constrained by things like size, power consumption, safety, reliability, ergonomics, environmental impact, and hundreds of other things. Theodore von Karmen, a well known aerospace engineer from Caltech, said that engineering is about "creating what has never been." That is, every successful design differs in some way from its predecessors. Either it provides a new function to satisfy some human need, or it achieves existing functionality with a better optimization of the constraints.

If you listen to a conversation between engineers about a great design, you'll hear the word "elegance" used liberally; the focus of the conversation will be at least as much about aesthetics as about technical issues. The aesthetics will be partly about physical form, but also about a pleasing economy of concept and realization, about novel ways to satisfy a constraint, about intellectual cleanliness, or about simplicity and naturalness of use. What distinguishes truly great engineers is not superior mathematics or science skills, but their superior creativity—their ability to produce elegant designs.

On those rare occasions that I have been party to a conversation between artists, I have been bemused that they are often as much about the mechanics of their media and technique for manipulating it as about aesthetics. Isn't it odd? The common stereotype of artists and engineers—of themselves and each other—are poles apart, but there is a great deal they share. Both are satisfying a human need. Both are creative and revere elegant expression. Both require manipulation of nature.

In Schultheis' work we see and feel the beauty and elegance of that shared space. It is hardly an answer to Snow's general concern, but it is not a bad place to start—so I am deeply pleased that our director of exhibitions, JD Talasek, has brought it to the Academies, which is not a bad place to start the conversation either.