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PRESENTER ABSTRACTS

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Acoustics in Architecture: Are We Thinking Too Simplistically?

Carl P. Giegold, FAIA, LEED AP
Threshold Acoustics LLC, cgiegold@thresholdacoustics.com

1. ABSTRACT

Research in architectural acoustics and the auditory system is usually oriented toward quantifying aspects of our perception, mostly related to speech intelligibility and spatial perception. The parameters so derived underpin our present understanding of concert hall acoustics as well as LEED, ANSI, and ASHRAE standards. Acoustic fundamentals (reverberation, background noise, and sound isolation) are expressed in simple metrics which have brought meaningful gains in the quality of our buildings, at least those to which the standards apply. Yet there remains an unexplored world of subtlety in the aural/auditory realm, our means of keeping track of tiny, unseen events that, in an evolutionary context, might mean either the next meal or an abrupt departure from the gene pool – the stakes were (and are) high, and the resulting acuity impressive.

LEED, ANSI, and ASHRAE all promote speech intelligibility, or clarity, in rooms that also minimize distraction and noise-induced stress. In the world of music acoustics, however, we also regard intimacy, presence, and immersion as the foundations of a strong performer/audience connection. These lesser-known characteristics surely enhance any form of human interaction but are largely absent from our evaluation of the classrooms, living rooms, and offices where we spend the greatest portion of our lives. If acoustics are considered at all in these spaces, it is usually in the vocabulary of absorption. Acoustical tile, acoustical plaster, and fabric-wrapped fiberglass absorb problematic sound, but do they perpetuate a simplistic architectural language that ignores a primal, physiological craving for complexity?

This presentation compares modern interiors with the outdoor environments where our hearing evolved. The differences are stark and beg greater understanding: In the context of LEED -compliant spaces, to what physiological needs are we still not responding? For example, would mimicking the forest canopy in a classroom ceiling (it would not be that difficult) heighten attentiveness or cognition? How might neuroscience help investigate the role of architectural complexity in our aural well-being? How might material science and new fabrication technologies translate that knowledge into buildings that enhance the clarity, intimacy, and presence of our everyday communication and, thereby, the quality of our lives? There is so much to learn and so much room for improvement.

2. AUTHOR BIO

Carl P. Giegold could be found haunting construction sites at the age of seven and by high school had settled on architecture as his pursuit. He earned a Bachelor of Architecture with honors from Virginia Tech in 1982 and specialized in acoustics in 1995 after exploring restoration, residential, and institutional architecture. This broad background in design and technical architecture adds great depth to his consulting in acoustics. He has carried design responsibility for scores of music and theater performance and educational spaces in the United States and internationally.

He is a Fellow of the American Institute of Architects and has presented his work and writings at conferences held by the Acoustical Society of America, Illinois Chapter of the Green Building Council, the Institute of Acoustics in the United Kingdom, and Ryerson University in Toronto. He has lectured architectural and acoustics classes at Rensselaer Polytechnic Institute, Virginia Tech, Illinois Institute of Technology, The University of Illinois, and Cambridge University.