

Barry Blesser and Linda-Ruth Salter, *Spaces Speak, Are You Listening? Experiencing Aural Architecture*. The MIT Press, 2007. ISBN 0-262-02605-8

Spaces Speak, Are You Listening? begins with a confession and ends with a plea. In his opening 'Personal Perspective', Barry Blesser, who is well known in the audio engineering field as a pioneer in the development of digital reverberators, confesses to 'an inadequate education', presumably referring to his narrowly defined training as an engineer, and to the genesis of this book as his attempt to integrate a much wider range of interdisciplinary perspectives. His theme is auditory spatial awareness (and the lack of general acuity thereof), as well as how aural spaces have been designed and can be perceived (what he refers to in the subtitle and throughout the book as 'aural architecture'). His final plea in the concluding remarks is that 'aural architecture may now begin to lead the culture' (p. 363) spurred by the technical advances that allow virtual acoustic spaces to be explored. The passion with which he has pursued this endeavour informs every page of this groundbreaking book which offers a well-informed survey of the experience of acoustic space based on a wide range of scholarly literature. It is a survey that will be of value to others who have suffered a similar inadequacy of breadth in their education.

According to its library classification, *Spaces Speak* finds itself beside a variety of other books dealing with 'spatial perception', none of which, from a cursory glance, refer to aural awareness, hence the fundamental chasm which Blesser and his co-author, Linda-Ruth Salter, a social scientist, attempt to fill. Their presentation is largely based on the traditional scientific model of sound as a series of energy and signal transfers which result in 'neural signals sensations ... perceiving ... emotion, or mood' (p. 12) as duly conditioned by social and cultural context, for four main purposes which they characterise as 'social, navigational, aesthetic, and musical' (p. 12). In chapter 2, Blesser uses his extensive knowledge of acoustics to describe and explain, with copious examples and simple analogies (from the visual to the culinary), how the physical behaviour of sound in actual spaces results in auditory spatial awareness of both enclosed spaces and soundscapes in general. Chapter 3 provides a detailed historical survey of acoustic spaces from prehistoric caves through Greek and Mayan structures, the religious spaces of Western civilisation (Blesser claims to have found no acoustic data on non-Western edifices), the Elizabethan theatre, the emergence of the modern concert hall, to the early twentieth century's scientific approach to acoustics, following Emily Thompson (2002) and her trajectory from Sabine's design of Boston Symphony Hall to the electroacoustic era of Radio City Music Hall. The chapter concludes with the transition from the 'spaceless' acoustic preferences created by the highly absorbent spaces of that era to the development of artificial reverberators that eventually led to the creation of virtual spaces in the contemporary world.

The material of greatest interest to electroacoustic music practitioners can be found in Chapters 4 and 5 that are respectively titled, 'Aural Arts and Musical

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Spaces' and 'Inventing Virtual Spaces for Music'. Here we find the details of how reverberation functions as temporal and spatial spreading to both reinforce the perceived sound source (i.e. early reflections) and create a sense of envelopment in a concert space. The second of these chapters is remarkable, not only for its visionary description of the limitless possibilities of virtual spaces created by what Blesser terms the 'spatial synthesizer', but also for his summary of current electro-acoustic music diffusion practice in creating innovative listening experiences for listeners. While the personages and practices cited (Stockhausen, Varese, Xenakis, Worrall, Harrison, GRM, Bourges) are familiar to the electroacoustic community, this is the first time to my knowledge that an informed written account of this practice has been made to an audience outside musical circles and integrated within a broader frame of reference, other than my own cursory account in *Acoustic Communication* (1984, 2001). Soundscape music (i.e. music performed outside of the concert hall) is also mentioned (thereby filling a gap yet to be addressed by any standard electroacoustic music text), though unfortunately the current practice of multi-channel creation of sound environments in soundscape composition is not. However, the chapter includes a survey of contemporary approaches and their limitations, such as binaural, transaural, and ambisonic models, large speaker arrays, sound reinforcement systems, and the historical development of film sound in leading to today's dominant paradigm of the 5.1 system of surround sound.

For those interested in the complex details of the acoustics of (mainly) concert halls and their perceptual evaluation, the difficulties of which bear more than a passing similarity to the study of timbre, Blesser offers a chapter on the 'Scientific Perspectives on Spatial Acoustics' which also includes a discussion of the topology of digital reverberators. The book concludes with two chapters whose topics are probably unexpected by the reader, the first being 'Spatial Innovators and Their Private Agendas'. Here we encounter a wide-ranging discussion of the social, cultural and economic factors that influence the production of knowledge and commercial products, ranging from epistemological concerns through to experiment design, peppered with anecdotes about how innovations in aural architecture have been discriminated against or compromised, a pattern common to all marginalised art forms. Although economic concerns seem to have the greatest controlling power, the author's analysis stays largely at the level of profit and the practice of corporate secrecy (i.e. proprietary knowledge), and doesn't extend to the increasing vertical integration of multi-national corporations that control media industries.

The final chapter, 'Auditory Spatial Awareness as Evolutionary Artifact' is a literature survey of the neuropsychology of perception with particular emphasis on the evolution of humans and other species. The author speculates on how this evidence might be applied to auditory spatial awareness and finishes the chapter with the argument that such awareness, even if sometimes undervalued, encourages social cohesion among subcultural groups. A thirty-six page bibliography, of great value in itself, and an extensive index round out the volume.

It seems somewhat ungenerous, given the dedication and interdisciplinary scope of the author in writing this unique book, to identify some of the inevitable gaps that will occur, but it is traditional for a reviewer to do so. Some lacunae are minor, such as the American composer Henry Brant being identified as 'Bryant', and the lack of reference to the phenomenon of the phantom image perceived between the left and right ears because of amplitude panning as a common feature of in-head localisation (p. 187). Others that are more substantial may be accounted for by the gaps between subcultures. I found it surprising that a book that deals so heavily with virtual acoustic spaces would contain no reference to convolution, which is now a common technique used by electroacoustic composers both to place a sound in a simulated space and to process sounds themselves (e.g. auto- and cross-convolution). On the other hand, many composers such as myself never use digital reverberation, except possibly when mixing live performers with pre-recorded sounds, and yet this is the main technique advocated by Blesser, who holds patents on such reverberators. To complicate the issue, he denigrates commercially available reverberators while extolling the high-end versions he helped develop but which most of us have no access to. Finally, the book only weakly relies on psychoacoustics for its argument, except for basic information about binaural localisation which is generally grouped under the heading of echolocation. Key concepts in my mind such as cocktail party effect and precedence effect are mentioned only briefly, whereas the brain's ability to separate correlated acoustic patterns from each other (cocktail party effect) and from the uncorrelated later arriving reflected patterns (precedence effect being

key to that otherwise arbitrary dividing line) seems central to auditory spatial awareness. Given the importance of uncorrelated material in multichannel speaker reproduction practices of the electroacoustic community, I would place these concerns high on the agenda of gaps in knowledge to be filled.

When I provided the publisher with an enthusiastic promotion blurb for this book, I concluded it by saying that it was a 'must read' for architects and students of aural culture, and I will stand by that assessment. Although *Spaces Speak, Are You Listening?* may not turn the tide of our society to undervalue aural architecture and, despite its cute title, it will likely become a standard text for those wishing to understand that most basic aural aspect of acoustic ecology, the relationship of individuals or a community to their spatial environment.

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