

Spaces Speak, Are You Listening? Experiencing Aural Architecture

Barry Blesser and Linda-Ruth Salter

MIT Press, Cambridge, MA, 2007, 437 pp, Price: \$39.95 (cloth), ISBN 13: 978-0-262-02605-5

Human beings have an awareness of the spaces in which they are living. This experience results from input to all the sensory modalities and is heavily based on cognition. Thus, it is always elucidating to look at multimodal phenomena by primarily focusing on a single modality as, for example, Patrick Sueskind has dramatically demonstrated for the olfactory sense in his novel *Perfume* (Penguin Books, 1985). Now we have a book that looks at the world from an aural point of view, focusing on the phenomenon of “auditory spatial awareness” and on the people that design and engineer it: “aural architects.”

However, this is neither a novel nor a stringently scientific work. It is a nonfiction monograph, written by an experienced and worldwide recognized senior engineer, consultant, and academic teacher in audio technology, co-authored by a scholar in the arts and social sciences. The authors themselves call their work an “intellectual mosaic,” attempting to fuse disparate knowledge into a common framework whereby they elegantly mix facts and opinions. Their approach concentrates on aural spatial phenomena, but they treat these from a broad, interdisciplinary viewpoint.

The volume presents no easy reading, but once you have worked your way into it, you will be swept away by its scientific and philosophical richness. In fact, the work “contains a lot of truth” to quote a German saying. This reviewer, once started, could not stop reading for two days and a night.

There are nine chapters plus some acknowledgments and personal statements by the first author. Chapter 1 is the introduction to the main topic, “aural architecture.” It deals with the essence of architecture in general and specifies its subdiscipline “aural architecture,” specifically, as the meaningful manipulation of the aural properties of space.

Chapter 2 tackles auditory spatial awareness as an experience, featuring subtopics such as soundscapes, unusual spaces, the social component of spatial awareness, and the components of spatial experience. The concept “acoustic arena” is introduced as a section of space within which a given group of people can share sonic events aurally. Another topic is navigation by listening, an art which some blind people master excellently. Other treated items are aural enrichments, spatial distortions, illusions of expanded space, aural textures, and the enveloping effect of reverberation.

Chapter 3 deals with aural spaces from prehistory to the present, with the notion of understanding the aural experience of space as a cultural filter. The discussion moves from caves through modern concert halls to radio broadcasting, including topics like auditory icons, religion, industrialization, and modern audio technology—always considering related social forces.

Chapter 4 regards the aural arts and musical spaces. In a philosophical introduction, musical spaces are looked at as artistic abstractions. This is followed by an analysis of what actually happens in these spaces perceptually, e.g., temporal and spatial spreading of the auditory events. The authors explain that, being elements of the sound-production process, spaces transform proto-instruments into metainstruments. The artistic value of auditory spreading is commented on in detail. Finally, spatial rules are analyzed concerning their applicability to music making.

Chapter 5 is labeled “Inventing Virtual Spaces for Music.” It provides insights into the invention process itself and presents a number of realized examples. To start with, the artistic dimensions of space and location are identified, and the way in which

controlled auditory location is used in music is explained. As documented in this chapter, natural spaces have been used to add spatial attributes to music; this has led directly to the creation of virtual aural spaces by means of electroacoustics. As an early example, the dome of loudspeakers which has been provided for Karlheinz Stockhausen at the Osaka World’s Fair 1970 is discussed. The two basic acoustic approaches of presenting spatial sound to listeners—namely, head-related with headphones or transaural systems, and room-related with multichannel arrangements of loudspeakers—are treated in detail, specifically regarding typical application scenarios such as automobiles, virtual spaces, live auditoria, and movie theatres.

The title of Chapter 6 is “Scientific Perspectives of Spatial Acoustics.” Here, the authors explicitly refer to science. In fact, this is the chapter where the first author draws heavily on his knowledge and experience as a technical expert in audio engineering. An interesting fact, however, is that there is not a single mathematical formula in this chapter—nor in the whole book. Yet, this does not in any way impair the exactness of the description of scientific and technical details. Actually, this reviewer feels confirmed in his teaching approach that thoroughly formulated prose can be as exact as mathematical symbolism. If it is not possible to describe the contents of a formula in words, something must be wrong with the formula. The scientific and technical details critically presented in this chapter extend from perceptual evaluation of concert-hall acoustics, such as psychoacoustic-measurement methods, preference judgments, identification of audible acoustic defects, and auditory source width and envelopment, to mathematical issues such as models of enclosed spaces and reverberation as a random process. A major section concerns generators for artificial reverberation. This is the nucleus of the first author’s technical competence, having built the first commercially available reverberator based on digital signals processing as early as 1974—together with Karl O. Bäder. Besides various technical details being disclosed in this chapter, it is especially interesting that a complete history of reverberators is presented and commented on here by a first-hand eyewitness. The author is obviously capable of self-critical reflection about his own role and the social context in which he was acting.

Chapter 7 deals with the people who actually prompt spatial innovation, and how this activity fits into their private agendas. This chapter has a heavy psychological and sociological touch. It discusses issues relating to social values such as goals, rewards and careers, resources, decision-making, knowledge, political power, conservatism as a cultural tradition, and career management. Fundamental concepts like subjectivity, personality, and cognitive judgment are touched upon, and more “global” issues like the life cycle of disciplines are broadly discussed. The intellectual framework is identified that underlies assumptions and paradigms, and the process of fusing intellectual fragments. The work of different categories of observers such as expert perceivers using formal science versus folk-science is examined, and epistemological backgrounds are analyzed. This reviewer read this chapter with commitment. He got the impression that the individual viewpoint of the authors stands out pronouncedly here. In other words, in a way this monograph is also an intellectual autobiography of the authors.

Chapter 8 treats spatial awareness as an evolutionary artifact. This is a compelling view, although the authors state correctly that Darwin's hypothesis of environmental pressure as a causal reason for evolution cannot be proven. Nevertheless, readers will agree with the authors that evolution as an empirical fact exist. In any case, to build a story around evolution is tempting as it allows for including ample speculations. Consequently, Chapter 8 is very entertaining, maybe because it is meant as a narrative exposition rather than a scholarly based proof on reliable knowledge. Still and all, many of the statements made by the authors seem quite plausible.

The final chapter, Chapter 9, concludes and sums up the material that has come before. Actually, readers may be advised to start their browsing of the book from this point. As mentioned earlier, the book is extremely interesting reading, specifically for the following reasons. First, it provides the first comprehensive coverage of auditory spatial awareness and aural architecture, although it is not a textbook for aural architects. Second, it presents relevant technical details of artificial reverberation and auditory virtual reality generators. Third—and this makes the book so fascinating—it allows a glimpse into how an experienced audio-technology expert and his wife, an interdisciplinary social scientist, both educated in and residing on the east coast of the United States

in the 20th century, experience the world of science and technology at large. This makes the work an invaluable document of our time.

JENS BLAUERT

*Institute of Communication Acoustics Ruhr-Universität Bochum
Bochum, Germany*