BOOK REVIEW

Barry BLESSER and Linda-Ruth SALTER, *Spaces Speak, Are You Listening? Experiencing Aural Architecture.* 2007. Cambridge: The MIT Press, 436 pp. ISBN 0262026058 (hbk) $ 39.95

Barry Blesser and Linda-Ruth Salter have produced an unusual book about architecture and its relation to acoustics; unusual, because it does not follow the canons of textbooks on architectural acoustics. These books first explain acoustics before endeavouring the hard task of teaching architects how they should design spaces for music from a *scientific point of view* - understood as the viewpoint of the physical sciences.

Instead, the authors deliberately chose to present architectural acoustics from the opposite point of view, not the architect's point of view, but nevertheless a point of view from the human sciences: perception. In this respect, the title properly mirrors the main message that the book tries to convey: architecture must be experienced with the senses - the sense of hearing in the present case. Thus this book inscribes itself in a tradition that started with Georg Simmel (1908) and Paul Valéry (1921), and reached its climax with Steen Eiler Rasmussen's classic on *Experiencing Architecture.* Correspondingly, this book addresses a broad readership, and I recommend the book to almost any colleague studying music in areas such as popular music studies, cultural studies, ethnomusicology, composition; but also to cognitive scientists and colleagues studying audio signal processing, psychology, sociology, archaeology, etc., not to forget acoustics. In short, as I wrote at the time of publishing, I strongly recommend the book to every one interested in an alternative approach to acoustics and architecture.

As usual, I started reading the book from both ends, reading first the introduction and then the references. And I confess that I am still impressed by the some 630 references, which include such unexpected names as Pierre Boulez, Chion, Diderot, Heisenberg, Krylov, Bruno Latour, besides more classical citations like Steen Eiler Rasmussen and Murray Schafer. Some of the papers are difficult to trace and find, and I sometimes wonder how the authors were alerted to their relevance. This explains why writing this book has taken over 5 years, if I trust my first communications with the authors.

Description

As stated by the authors in the forewords, the striking feature of the book is its very personal approach. The authors had great fun reading all the material they accumulated and shaping it into a book, albeit a tough job, and the reader shares their fun. This makes the vast amount of information - 7 chapters of some 50 pages each -

a long task to read, but it is an easy, even enjoyable and rewarding one. And this makes the book adapted to a broad readership, to some degree or other.

The structure of the book is articulated around *three theses.* The first thesis, developed in Chapter 2, states that *whereas psychoacoustic scientists are interested in quantifying sensation, artists emphasize perception and meaning.* It constitutes the backbone of the book and is applied to the analysis of soundscapes and the sound sources (sonic events) that fill them and make them aurally perceptible. The analogy with light sources in landscape and architecture is evident, and the authors use it to stress the main difference between visual and aural perception: the latter fundamentally involves time, quite unlike the former. Hence, experiencing aural architecture also amounts to experiencing time.

Following the literature on soundscapes, the authors carry on toward the social components of aural architecture, introducing the concept of *acoustic arena,* as the area where listeners can hear a sonic event sufficiently clearly to understand it. Thus, background noise is introduced on the basis of (un)desirability, that is, in terms of meaning and not as a physical concept measured in decibels. Many examples, taken from the literature, are given to illustrate this concept, gradually introducing the possibility of navigating in a space just by listening, an ability of some blind people known as echolocation. The authors seem fascinated by this ability, describing it at length by means of a case study, and I must confess that they succeed in making the reader share their fascination. This leads them to the concept of cognitive maps, however warning the reader that such a map is not simply a "photograph" created by the brain: there are some distortions due to illusions or even anomalies in the soundscape. Enveloping reverberation is one of these distortions, introducing both an aesthetic dimension and meaning to the space, as illustrated by the colourful words used to describe it. At this very point, the authors turn their back on classical psychoacoustics by assuming that "connections between physical objects and tonal color are, no doubt, learned". All these concepts lead the authors to conclude the chapter by stating that there are four distinct modes for experiencing aural architecture: social, navigational, aesthetic, and musical (artistic). These four modes exist simultaneously, but we only experience one or two of them, depending on the context, such as when attending a concert hall.

The second thesis, developed in Chapter 3, states that the *aural properties of space were not the result of conscious design, but of unplanned and inadvertent accidents,* which were then interpreted though the prevailing cultural filters (social and religious values). Since these filters are often forgotten, it is impossible to know how contemporaries perceived the acoustics of such spaces as prehistoric caves. We are left solely with historical evidence - written evidence - and with early anthropological studies of preliterate tribes to try to reconstruct how aural spaces and their expert manipulation affected prehistoric listeners. The authors then proceed with reviewing evidence from archaeology and history, observing that scientific explanations did not contribute to understanding the evolution of aural architecture, and they succeed in writing a very informative chapter based on an impressive literature survey. Their *hypothesis* is that our aural experience of space has remained relatively consistent and is deeply linked with religion and philosophy, but their case suffers from an almost exclusive use of Western examples due to the lack of extra-European published material, as the authors regretfully point out. On the other hand,

they also point to a parallel secular conception of aural spaces, illustrated by theatres and public performance spaces - strangely enough, they do not mention the political agora and forums - which also contributed to social cohesion. Music playing was part of it, and musicians learned to adapt their style to the spaces they were playing in. It is truly enjoyable to revisit the well-known examples in the acoustic literature (the Greek theatre, the Gothic cathedral, the shoebox concert hall, etc.) from these various points of view. Finally, the electroacoustic revolution at the end of the 19th century split the single aural space that gathered together performers and listeners into separate performance and listening spaces, thus creating new aural attitudes, which eventually led to a redefinition of acoustics by engineers that amounted to a negation of spatial acoustics. Indeed, the very dry studios and halls of the early 20th century were devoid of any reverberation. Unexpectedly, though, they increased listeners' interest in live performances, leading to the present renewed interest in acoustics.

The third thesis, developed in Chapter 5, states that *when given a free hand, artists do not restrict themselves to existing spaces, but invent new concepts of space.* Indeed, when they were given the opportunity to compose spatial music, 20th century composers invented paradoxical spaces that cannot be built by architects and are the aural pendant of Escher's drawings. This freedom in space creation was made possible by the electronic revolution that provided new technologies to both create and reproduce music (electronic music, loudspeakers), thus creating virtual spaces. This thesis is backed by the description of many compositional experiments, some of which are rooted in history and stand in prolongation of classical composers. The review is quite comprehensive, including all of the major trends (schools) of the 20th century, with the bizarre exception of Iannis Xenakis - who, as a composer and an architect and collaborator of Le Corbusier, produced some major writings on the relation between space and musical composition (Xenakis, 1971, 2006), and who also produced performances based on this relation (Polytopes, Diatope). This thesis also gives the authors an opportunity to review current trends in research on sound field displays, from personal displays in automobiles and cinemas to large virtual spaces and auditoriums, concluding with a convergence of art and engineering in enveloping sound.

The three theses are summed up in the central thesis of the book, developed in Chapter 6: *it is illusory to put perception into an equation.* Coming from an engineer, whose task is to create equipment that follows some predictive pattern, for which equations are very useful, the thesis is surprising, and I must confess, welcomed. The personal position of the authors is further illustrated by such section titles as: "the elusiveness of quality preference", or "struggling with subjective measurements". This sounds like an echo of Chapter 4, where musical spaces are considered as musical instruments of a second kind, superposed with the musical instruments of the first kind that constitute the sources of music. In other words, musical spaces are *metainstruments,* which can be evaluated from an artistic point of view like any other music instruments. However, despite this stress on the artistic point of view, when the authors turn to describing metainstruments, they cannot detach themselves from their engineering background and the descriptions remains at the acoustic level: the temporal structure of the reflections leads to both source localisation and a fused auditory event. In a similar way, they define high quality acoustics by the "inelegant proposal" of the absence of objectionable acoustic defects, further arguing that many

of the goals of scientific research on spatial acoustics escape the auditory awareness of virtually all the listening public.

The last chapters are an attempt to pay off old scores with research management and the lack of creativity it creates in many colleagues; and an evolutionary creed that gives the authors an opportunity to ride the wave of cognitive neurosciences, one of the magic words of contemporary research! Placed in its North American context, this firm stand for Darwin's theory is certainly welcomed, but it suffers from too much superficiality to convince the reader.

What to remember

The major impression left with the reader upon closing the book is the prevalence of the engineering point of view. We have stressed this prevalence earlier in the review, but it lurks at unexpected place. When describing cognitive maps in Chapter 2, the authors cannot depart from the cartographic point of view: they mention distortions. This point of view stands in strong contrast to the point of view adopted, for example, by Apple Human Interface Guidelines that advocate the *user's mental model,* not his/her cognitive map. Similarly, what acoustically characterises a musical space for the authors is the production of temporal and spatial spreading that modifies the sound of the sources. Artistic relevance is only used to assert that no room is actually needed, and could be replaced by a digital reverberator. We are far away from the literary description of the same perception by the poet Paul Valéry, who states that, when attending a concert, "the original space seems substituted by an intelligible and changing space, or rather time itself is surrounding one from all sides" (Valery 1921: 32).

Indeed, the engineering background probably is one feature that will make the book memorable. It parses the most fascinating chapters, despite the authors' own argument that our limited understanding of auditory spatial awareness is due to the fact that art, sciences and engineering have different goals. For example, they succeed in catching the reader's attention when taking her/him on a visit inside digital reverberators, describing their basic components and topologies together with their properties, and pointing out where the technical difficulties reside. Nevertheless, they conclude that designing artistic reverberators is an art mastered by very few specialists who have spent years on their particular design.

This book will also be remembered for the quotation from Einstein's office at Princeton that "not everything that can be counted counts, and not everything that counts can be counted". This is another expression of the central thesis of the book - it is illusory to put perception into an equation - and illustrates the fundamental dilemma of cognitive strategies: the *exclusive* choice between *reliability* (scientific research), and *applicability* (artistic experiments). Overlooking this dilemma results in scientific research that is only valid within the laboratory, and almost useless in radically different contexts - that is, in real life; folk science is better for normal life experiences but useless for understanding phenomena. As an example, experts, who systematically deviate from average performance due to their ability to hear subtle differences, are therefore outliers in formal scientific experiences. Therefore, the authors plea for a holistic approach that fuses laboratory experiments with intuition,

yet can lead to formal theories. It is however doubtful whether they reached their aim within the context of aural architecture.

Despite the many references peppered through the book, sociology probably is the *parent pauvre* of the argumentation. The reader learns that social forces predominate and shape the aural spaces. Further, the authors argue that auditory spatial awareness has contributed to the success of our species, and therefore to the social cohesion of our species. And taking the historical example of the theatre, which contributed to social cohesion simply because of the shared experience by the group - and this is in agreement with Simmel (1908) - they conclude that aural architecture influences social cohesion. However, even though a current of sociology, rooted in the work of Emile Durkheim, argues that "sanctuaries" play a key role in social cohesion (Greve, 2006), this must be credited to the beliefs that underlie the authors' conception of science, because proper arguments are not developed.

Style

A consistent use of the first person singular - although there are 2 authors - definitely contributes to the personal style and the enjoyment of the reader. But more contributes to it, especially the iconoclastic style adopted by the authors. For example, for the authors, Sabine is not an aural architect, but an engineer answering the brief of his client in the best technical manner! Indeed, Sabine did not design a new type of space, but simply copied an existing one. The critique of research management in the Western world, both in academics and industry, and their argument that it reduces creativity belongs to the same vein. The authors also advocate the use of digital reverberators by aural architects in order to create virtual spaces and acoustics, but this is probably no longer iconoclastic.

The entertaining aspect of the book is further nurtured by the superficiality of many digressions outside the focus topics of the authors. Indeed, it is impossible for a single individual to master all the facets of such a pluri-disciplinary topic as aural architecture. Most authors would have had recourse to a broader authorship, calling upon experts for each chapter. But multiple authorship has other drawbacks. As it is, this book exemplifies both the advantages and inconveniences of single authorship: a more unified treatment and a lighter style - less scholarly - but at the expense of exhaustiveness and at the price of some superficiality.

Last but not least, it must be pointed out that writing an entertaining text does not mean that the authors' conclusion is overly optimistic. Indeed, they are rather pessimistic when they state that even when children have a genetic predisposition for auditory spatial awareness, the indifference of our culture for such predispositions does not encourage them to train and develop this skill.

In summary, one will remember the book for the firm stand taken by one of the leading engineers in acoustics - one of the authors is a former Professor at MIT - against the widespread belief that numbers are the only things that count, accompanied by a plea for more "meaningful" research, that is research with artistic applicability. In the old dilemma about aural architecture - is it a science or an art? - the authors plead for an interplay between the two, but under the leadership of art. This leadership is necessary to create what Paul Valéry called "buildings that sing" (1921: 20), because it is illusory to put perception into equations.

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