



Listening architects

Architects have considerable knowledge of the way in which light, size, form, material and climate all affect how a room is perceived. The significance of sound, on the other hand, is rarely a subject for discussion. But hearing has at least the same effect on how one perceives a room as sight does. If good cooperation between acousticians and architects can be established at an early stage in the planning procedure, with interaction between the different areas, the architecture can be given an extra dimension through conscious, acoustical design.

“Acousticians are blind, architects deaf”, the Finnish acoustician Henrik Möller said at an acoustics seminar a few years ago. He talked about how both of these professions ought to be better acquainted with each other’s fields. The architect should have an active role in designing the acoustics and have close cooperation with the acoustician from an early stage. For a considerable time now, acoustic design has been important in the electronics business. There is, I feel, much to be gained in the same way by putting conscious effort into the design of the sound environment of buildings. There are many buildings in existence where the sound environment is alarmingly bad, with the acoustics and the architecture taking up contradictory positions. One example I remember is from a visit to a newly built hospital where, right in the reception area, one was struck by the noise from metal trolleys, signals from different pieces of apparatus, and from coughing and other noises from the wards. Was this really the atmosphere that the architect wanted people to be greeted by at the entrance to the department?

Sound environment design should not just be an interpretation of prescribed technical requirements. Hearing is one of our most vital senses for spatial understanding and perception, and it can provide us with completely different impressions from those we get from sight. Sound design should therefore be one of many important tools used to create space, atmosphere and structure. Sound results in spatial feedback that is dependent on the design and size of the room and on the material used in it. On the basis of experience, we can understand what kind of material the sound has been reflected against, and also the size of the premises. A wall that stops the visual extension of a room does not necessarily prevent it auditorily. In the same way, a pane of glass can obstruct sound without limiting the visual aspect. With the help of an acoustician, an architect can work on reverberation time, sound insulation, active reduction of sound, emphasis of certain sounds, special effects such as focusing or echo, and artificial electroacoustics.

During an interview, acoustician Johan de Sousa Mestre described how acoustic planning could work. Right from the beginning, close cooperation should be established between architects and acousticians. In the programme phase, a scenario is described. What is the architect’s vision as regards sound environment? What are the regulatory requirements? What kind of atmosphere do you want to create? What are the wishes of the end-users? Needs and design goals are defined in a document in accordance with which the acoustician then can work. It is always possible to revert to the original ideas and not get distracted amongst all the technical requirements. During this phase, it is important that architects and acousticians have joint references and that they can have a clear and simple communication of ideas about how to realise their visions. If the question of acoustics is discussed too late in a project, the solutions often become too costly and not particularly pleasing from the aesthetic point of view.

The Swiss architect Peter Zumthor has said: "*To experience architecture in a concrete way means to touch, see, hear, and smell it. To discover and consciously work with these qualities.*" Zumthor's thermal baths in Vals, Switzerland, is a project in which the acoustics have been meticulously designed to emphasize the architect's spatial intentions. The baths have several different rooms, each with a different atmosphere. Echo effects and specially designed sound suppression at certain frequencies give the different baths specific characteristics. Pehr Mikael Sällström describes the baths in an article in the Architecture journal: "*Peter Zumthor's baths in Vals confirm the environmental/psychological theory that the sound environment is of greater significance for the overall effect of a room than the visual design. It is very clear that the sound climate is decisive in building up the atmosphere of the room. (...) An observant architect is also a listening architect.*"

There are numerous ways for the architect to work with acoustics in order to emphasize the architectonic intentions and to create a positive sound environment. A great deal of technical research has been performed as to how acoustics can be regulated. But acoustics are rarely discussed in connection with design. My hope is that, in the future, it will be more common for architects to fantasize about how a room should sound. That we will witness seeing acousticians and listening architects.

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This text is a short version of a student work completed by Malin Hultmark, architecture student at Chalmers University of Technology. As an internship, Malin created several building case studies of projects involving Ecophon solutions. The numerous interviews made under that internship, together with extensive reading on acoustics and architecture inspired the text

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