

Towards a multisensory education of environnement in Architecturales & Urbaines"
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### Towards a multisensory education of environment in architecture

#### Summary

The teaching of the science of environment to students architects cannot make do with a solely technical approach, the diversity of professional procedures, the evolution of tools for project and the new materials are reasons enough to prompt us to diversify the methods of education (lectures, workshops, seminars ...) as well as the disciplines taught (technical education, sociology, ethnology, history, architecture, town planning ...). Only an interdisciplinary approach is, in our opinion, suitable to give the student a broad view of the problems broached by this subject, and this is why the CRESSON-CNRS laboratory has been striving for nearly twenty years from within the Grenoble School of architecture for this type of approach.

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Currently, as much due to new tools wich supplement plans, as thanks to a significant growth in incentives, experiments and new materials, it is becoming increasingly easy to conceive of spaces in term of specific environment (atmosphere). That applies, moreover, in the sense of the requirement of consumers who hardly ever ask themselves questions about structure, electricity or plumbing ... (in developed counties, at least), but who assert a desire permanent for "comfort".

In their projects architects often refer to the necessity of taking advantage of the physical feature of a site. This is why the climate, hours of sunshine, daylight... and more rarely acoustics are advanced as justifications for decisions. What's more architectural journals have largely come to echo these views.

Occaisionally, the notions of environment are only approached according to economic criteria (particulary thermal ones) and this point is enought to justify an examination of environmental control.

In the case of some specific buildings (usually prestigeous ones), the notions of daylight (for museums ...) or acoustic quality (for concert halls ...) will be taken in consideration.

Generally, in architecture schools, education on luminous, climatic and sonic environment is put in the field of science and techniques for construction. But if this education comprises subjetcs which refer to applied physics "Thermodynamics, Photometry, Acoustics" and to technology, then it must also include the notions of physiology of perception, psychology and sociology. Theses notions are not all taught as a matter of course during studies, and when they are, it is still important to show that they particulary apply to architectural and urban surrounding.

The CRESSON-CNRS laboratory situated within the Grenoble School of Architecture has been working for about twenty years on an interdisciplinary approach to acoustics and sonic environment, this work has led us to create an interdisciplinary tool : the sonic effect<sup>1</sup> which has since shown its potential to :

- decompartmentalise what we know about sound and sonic activity

- describe and depict complex sonic situations in "ordinary" architecture

- and finaly, to make teaching about sonic environment easier.

## The sonic effect : an educational tool

A definition of the sonic effect can also be found in J.F.Augoyard's text<sup>2</sup> from which I borrow part of my remark when I quote the "**cut off effect**" : this totally standard effect is well known in connection with environment, industry, music ... and consist of a sudden drop in the perceived sonic impression.

First comment : the sonic intensity is not always the only thing involved, changes in rhythm, timbre and tone ... may cause this effect.

Second comment : a change of space is often the cause of this effect (going throuth a reverberating hall, closing a door, going into narrower road ...) and in general it is not in the place where one would situate this change on the visual plane that it takes place on the sonic plane.

Third comment : this effect is not reversible, that is to say, passing from one side to the other of a door which oppens onto a noisy street does not bring about the same "effect", and whatever the sensation perceived, it does not occur in the same place.

Fourth comment : there can be a sonic cut off which is "subjective" (non quantifiable) and whose significance for the subject who feels it has no less value than others (those that can be quantified !).

Such an "effect" obviously brings into play complex physical and spatial variables, but also psycological, cultural, social, media related and indeed aesthetic ones.

A very quick definition of the "sonic effect" could be the following : it is a theoretical model crossing the fields of knowledge, half way between the universal and the specific, wich while being compatible with general discussion, cannot do without examples.

<sup>&</sup>lt;sup>1</sup>Augoyard J.F., Torgue H. et alii : À l'écoute de l'environnement: répertoire des effets sonores - Marseille - Parenthèses - 1995

<sup>&</sup>lt;sup>2</sup>in : Sonic quality in the living environment - International symposium - Grenoble - 1991 - Org : Lab CRESSON

In this way, we have made a list of nearly a hundred sonic effects (of which sixteen are very fully described) which allows architects to describe very quickly (and in an interdisciplinary way) a sonic universe.

Our experience in this field and the few results obtained, as much by students and researchers as by professionals, have led us to renew this work in the field of visual environment. This work is still in progress, but it is already alowing us to work with some students.

# **Interdisciplinary practice : current evidence**

Now let's leave the field of the sonic environment (where interdisciplinary no longer needs demonstration) and move on to the luminous environment.

The student of architecture (and the architect !) communicate their projects in an essentially visual way, and what's more, drawing in all it's forms is an integral part of their training. But representations of the world (and of architecture) cannot make do with solely visual representations, and if drawing is a convenient tool of communication, its rules, traps and codes still have to be mastered.

As regards on luminous environment, research underway within our laboratory<sup>3</sup> shows, after an investigation of about ten light-specialists, wide scale use of scenografic, ecological and urbanistic references, backed up by reliable professional competance. But while they assert that their projects can only be represented by a drawing which highlights an aesthetical aspect, they adopt a critical attitude to the picture which can in no way represent the whole of their project. A picture that is too good is, in fact, quite harmful, because it tends to make the project more inflexible (it is expected to be identical to the picture !).

The contribution of the semiology of picture as well as symbolic, social and psycological factors are essential for the advancement of teaching. In addition an historical approach to light (urban light in particular) is carried out in order to place current luminous techniques in an evolutionary context.

Work which has been carried out for several years with fourth years students of the school of architecture has served clearly to highlight this. The task that is put to them is to represent, by whatever means best suits them, an existing nocturnal urban space, and to propose a lighting modification to it (as if it is a sketch destined for a public ownership). The first phase of the work (representation of the existing space) involves a technical and spatial analysis of the chosen sight. For the second phase, the intentions and principles of the alterations must be clearly explained. In this way, the work required becomes a dialogue between this idea and the ways of representing it. Unlike lightspecialists, students cannot call on their profesional experience and all the shortcomming of the picture/object can be detected. This exercice allows them to recognize (by arranging a comparison between their different rendering) another form of town-planning, and the risks of certain types of representation. The evaluation of this work requires comments from the teachers of several disciplines.

<sup>&</sup>lt;sup>3</sup>Fiori S. : Ways of representing luminous noctural urban moods with pictures - Thesis underway

## **Intersensoriality : a necessity**

Finally, our laboratory has been working for a short time (in collaboration with the CERMA-CNRS laboratory of the Nantes School of Architecture which specialises in the problems of Thermodynamics and airflow) on an intersensorial approach which mixes thermodynamic, sonic, luminous ... indeed olfactory criteria.

The necessity and difficulty of such a step is obvious. Indeed, how can we talk about a sonic environment while disregarding the visual or olfactory components ... which, as we saw with relations to sonic effects, are unconnected but interactive ? Also, how can we talk about all the elements of an urban surrounding at the same time without going beyond generalities ?

A program of research is underway on this subject, principally thanks to the postgraduate diploma shared between the two laboratories and these are under way. Furthermore, this postgraduate diploma has the distinctive characteristic of being conducted by two sites that are seven hundred kilometres apart. A direct computer and sound link allows exchanges between lessons, naturally, new teaching practices come about as a result.

## Conclusions

It is nevertheless advisable clearly to make the distinction to students between the analytic tools of a site, the conceptual tools and those used for verification. The sonic effect, an analytical tool, has started to prove its pertinence for the conception of ideas. The representation of a nocturnal urban site brings all these three tools into play, but it does not mix them. Finally, our current work on intersensoriality only concern analysis.

Furthermore, architecture schools have some of their own particularities :

- in general, there is no clear and universal accepted definition of the contents. The terms : "sonic environment" or "acoustics" for example, do not cover the same area, and what can be said about the terms "environment, atmosphere, mood" ?

- we must find specific methods of transmission for those teachings which are reputedly difficult (talking about logarithms or making difference understood between illumination and luminous intensity to quote just two examples).

- we mut find ways of integrating this knowledge into the architectural project, and to work with teaching architects.

These particularities only go to confirm the necessity of an interdisciplinary approach, which, even if it is obviously still easier to describe than to put into practice, is becoming more and more of a reality in architecture schools as a whole.

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