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ARCHITECTURAL AND URBAIN AMBIENT ENVIRONMENT.
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Deficiencies in the Research about architectural and urban ambient Environment and
Proposition of new Tools.
the sound example.

SUMMARY

If in precise field, the Research about architectural and urban Ambience is well developed and specialized, it has nevertheless 2 big handicaps. First, being strongly rooted in the physical knowledge, it doesn't know yet how to take into account the other qualitative dimensions. Second, it only applies its knowledge to precise architectural forms and urban situations. It too often forgets to qualify the ordinary daily and trivial comfort of life. To illustrate more precisely these handicaps, I am going to stick to only one gender of ambience which is the urban sound environment, in order to show how the interdisciplinary notions, like the Sound Effect, can be a step to progress towards an integrative theory of architectural and urban Ambience.

KEYWORDS : qualitative dimensions, *in situ* method, interdisciplinary paradigms, Sound Effect,

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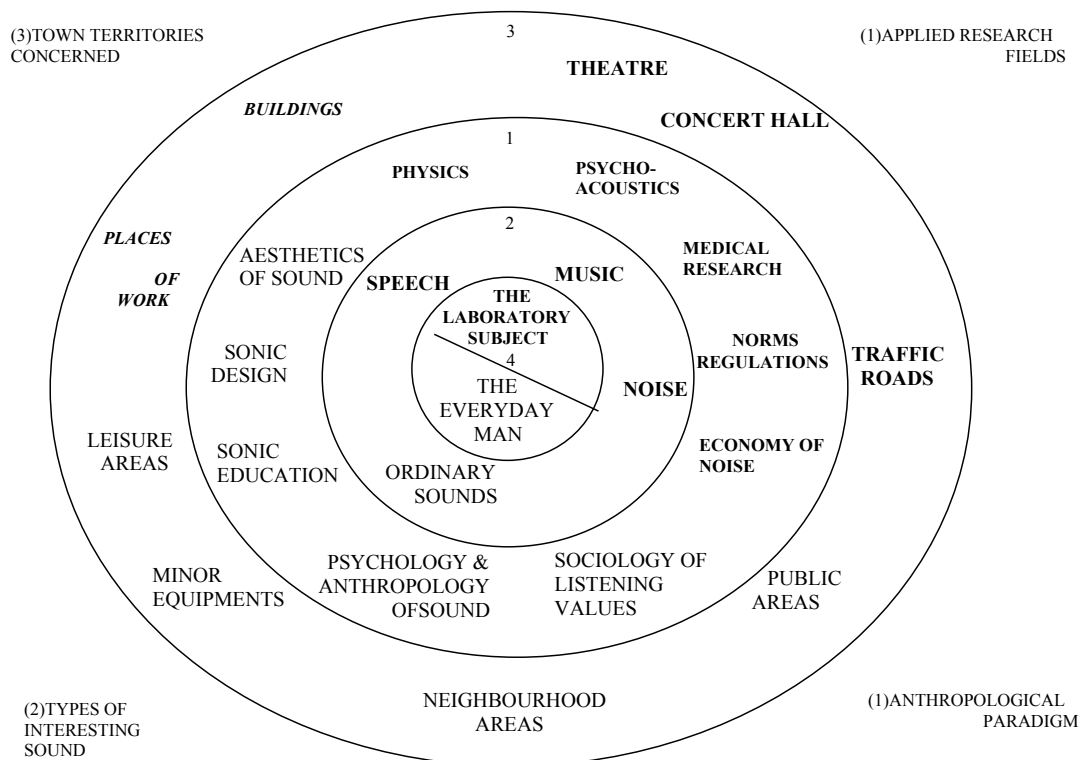
The Cricket Effect.

With the coming back of Springtime, the country re-echoes with plenty of sharp rustles. If you come near to see the musician insect it doesn't seem to be there and yet it is again nearer, louder or slightly out of its place. The other insects start on it, as if to make fun of your obsession to control everything by eye. So you don't really know who is playing this ubiquitous impromptu. The whole nature is resounding now and seem to surround you with a kind of nice irony. This scene could be left as a splendid object of meditation if Ethology didn't open up our eyes and ears. In fact, a deep functional wisdom has been given to crickets. Their small sizes produce a heavy handicap. They can emit very large distanced high-pitched sounds but only in one direction. So as to overspread more generously their territories they turn around themselves as a pencil radar and doing so, they sweep away an extensive area.

This sonic pastoral image defines perfectly the state of the Research about architectural and urban ambient environment. This Cricket-Researcher shows up well, but it doesn't know how to revolve.

And to illustrate more precisely the Cricket effect handicaps, I'm going to stick to only one gender of ambient which is the urban sound Environment. Up to the reader then to make the comparison with the other fields –lightning, smelling, thermo-aerolic...- and to discuss over the following diagrams. But, I advance the hypothesis that good crickets can't be found in none of these fields and that still a lot of things have to be developed.

-1- SONIC RESEARCH & URBAN EVERYDAY LIFE



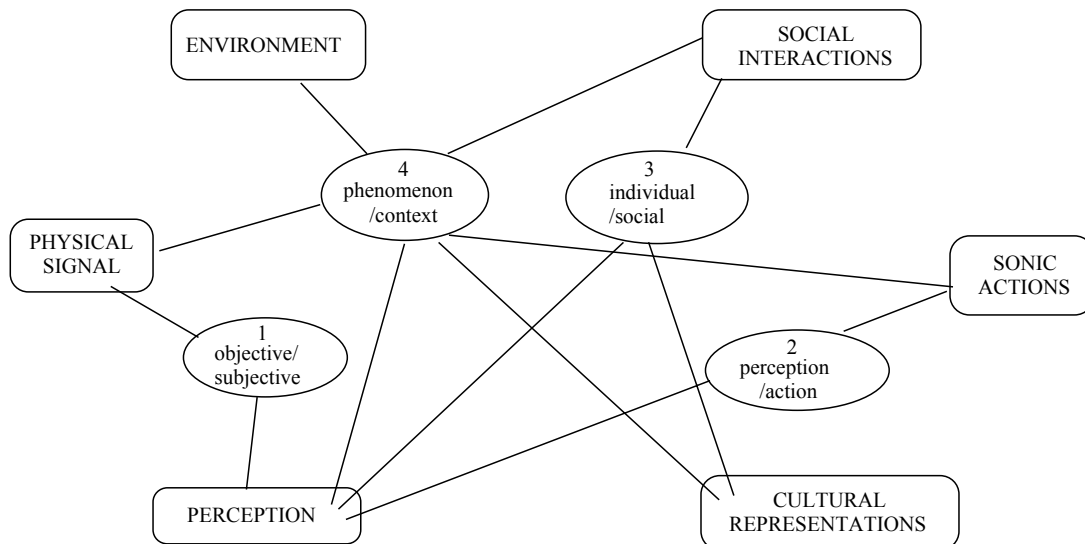
J.F. Augoyard. CRESSON umr CNRS/Culture1563.1998

Today, what are the Research performances in this scientific area? (diagram 1). Concerning the qualification of sound in a constructed space, there are presently two types of Physics Research, three types of interesting sound and two application fields. 1) Over the past ten years, applied acoustics has been developing two types of innovative and high-performance techniques : methods for simulation and measuring for room acoustics and new measurements of intensity. 2) All these efforts produce by science and technology deal with only three kinds of sounds connected to speech, music and noise. 3) The spaces at stake are theatres and trafficways. One can notice that buildings are studied only in relation to their sonic disturbances.

To sum up, even if the Research goes very far it is always referring to the same precise objects. Most part of urban territories are neglected: housing, minor equipments, multi-functional and neighborhood public areas. Only one matter is left to ordinary Architecture : the norms and regulations concerning insulation procedures. Another handicap is that only three kinds of generic techniques are available: the insulation, the mastering of reverberation, the working of the emergencies. In fact, only one anthropological theory can be found behind these scientific and technical attitudes : the traditional behaviorism always inspired by the same paradigm : the laboratory subject.

An enormous work in various directions is still to be done: on qualitative properties of sound, on social and cultural listening values, on sonic acting, on the sonic dimensions in the architectural conception, and on intelligent organization of a sonic life in town. How to be an efficient cricket? Can the Research efficiently sweep across this area?

- 2 -THE MAIN DIMENSIONS OF ORDINARY SOUNDS



6 MAIN DIMENSIONS

4 NECESSARY RELATIONS TO RESPECT THE COMPLEXITY OF *IN SITU* URBAN SOUND.

The basic work to be done is to identify the main dimensions at stake in any daily situations. At first, all signal can be modified by a physical environment (diagram 2). Then, perception comes along to bring a second selection linked to personal aptitudes, character and story. Every individual uses also, without knowing it, typical cultural filters such as representations, values, opinions, remarkable sensitivities, acquired reactions and codes essential to any social interactions (for example, to hear only what one wants to hear, to prick up one's ear, to raise one's voice, to adjust the listening to the social context. At last, action, motion, planning and intention constitute the state of reference of every individual (cf. the recent works about perception in context: neuro-physiology laboratory of the Collège de France, American ethnomethodology).

As a conclusion, all research on sonic ambiances as well as on ambiances in general which is interested in the context and in the *in situ* observations have to take into account these 6 dimensions without forgetting any of them.

Two basic tools : the Sound Object , the Soundscape.

To be honest, some sound pioneers can already be found in this great desert. Who cares for urban sound everyday life to day? Some architects who can think the shapes in a sonic way, some urban designers trying to use the ornamental function of the sound, some very scare psychologist (E.Lecourt), historians (A.Corbin), some lonely passionate anthropologists, (V. Zuckerkandl, M.Mac Luhan, S.Feld). And, at last, some Research Public Offices in Europe convinced of 2 certitudes : regulations and techniques have not reached their optimum conditions yet, and they only deal with one part of urban life. But it is even more difficult to find, in the world, groups or laboratories which would reassemble all the necessary disciplines such as Acoustics, sonic Aesthetics, Architecture, Human Science, Social Science to work especially on the urban sound space. And yet this has been the challenge of the Center of Research on Sonic Space and Urban Environment. How has this been possible?

In fact, the first proceedings about thinking differently the sound contemporary world came from the field of the musical Research. Two imperatives have built up this new attitude : the come back to the basic sound phenomenon, the thinking of the sound in a global and ecological way. Two essential concepts condense these works : the *Sound Object* and the *Soundscape*." Discovered in the years 50-70, they are basic works because they both succeed in gathering three functions into only one notion : the explanatory method, the describing method, the interdisciplinary proceeding.

In this famous "*Traité des objets musicaux*"(1965), Pierre Schaeffer hustles the classic classifications between noise, sound and music. The main concept of *Sound Object* can be applied to any sound of the environment. It doesn't refer to a certain classification but to a way of "plunging" into the sound by the means of the "reduced listening". This attitude we accidentally practice, becomes with Schaeffer the base of a three goals theory: first, questioning the sound experience common to all listening; second, showing that all sound phenomenon necessarily implies the physical signal and the intentionality; third, isolating the elementary unit of a new sol-fa of sounds. The project ran over Schaeffer's will to lay the foundation of a new musicology. In fact, it deals with a general phenomenology of the listened world. Pierre Schaeffer brings a basic change in the way of considering sounds. Nevertheless, this valuable process has its limits. The sound analyses is too close to the linguistic pattern. Concerning non-musical situations, its applying involves a sound by sound procedure which is too heavy. And lastly, it puts the context and the environment in parenthesis.

It's precisely this other necessary aspect which later on Murray Schafer, with the concept of *Soundscape* will bring forth. The process of the famous "World Soundscape

Project" assumes that the sound environment can't be reduced to either the quantitative acoustic valuation or to a struggle against noise. We can listen to the sound world as to an organized ensemble which expresses a culture. One has to learn how to discriminate the dimension of the composition in the most ordinary sound situations. And yet, some conditions are necessary : to re-educate the listening attitude in the sense of getting "a clear ear"; to privilege the pattern given by nature or by the cultures which protect themselves from the hell of noise; to give importance to the clarity of the hi-fi faced to the low-fi which destroys the sound culture at the scale of humanity. Above all the Soundscape determines what in the sound environment can be perceived as an aesthetic unit.

Murray Schafer's interdisciplinary and ecumenical Research has brought through a large draught in this scientific context all obsessed by sonic disturbances and automatic and technical answers. It rehabilitates ordinary and forgotten sonic cultures. It points out the immense didactic interest for a real ecological listening. The ordinary sound aesthetics can be understandable. In the analysis of urban space, the theatrical aspects linked to the concept of Soundscape set however some problems. What shall we do with noisy or indistinct sonic situations which depend on the *low-fi* category? Can we ignore them? Can sonic ordinary aesthetics break away from an organization pattern which keeps something musical? Endly, can the concept of Soundscape itself get free from an occidental landscape tradition marked by the logic of the eye? Such an eloquent notion has been so reemployed and distorted, after the seventies, that it has somehow become more vague. Murray Schafer's concept is very pertinent, it helps the analysis, the creation, the preserving, the education in the aesthetic and cultural field. But, is it often too large for the detailed urban life analysis.

To summarize, if we want to describe and name with enough precision the sonic forms observable in daily life at the scale of urban Architecture we are lacking of concepts. Taking the image of language, the Soundscape should be useful at the level of a text structure as a whole whereas the sonic object would correspond to the elementary level of words or syntagms. To work at the intermediate level, we are lacking of describing tools those of a phrase grammar. We don't know sufficiently enough the code of the possible configuration between the component of an urban sonic ambience : the acoustic sources, the constructed space and the sound perception.

The Sound Effect: where does it come from?

Since the beginning of the eighties, the Research Center has been asking questions about the deficiency of multidisciplinary tools. The notion set at the center of our proceedings is the one of the Sound Effect. It appeared step by step raising out of the questions issued from three fields of Research.

1- The Sound Effect has been first observed in the field of Human science. Our works about perception and sound daily practices (1978) had printed out the existence of 4 important psycho-sociological procedures : the sound marking in the living space, the sound coding of interpersonal relationship, the creating of symbolic value linked to daily sonic phenomenon and, at last, the interacting between the sounds heard and the sounds produced. These 4 procedures are active not only in urban daily life but in noisy situations as well as in any musical listening too. They can't be described as either simple reactions to stimuli or as ordinary subjective impressions but as processes of aesthetic type. They are localized configurations of the physical sound fact. In this respect, information gathered in surveys were analyzed as *effects* in the sense of phenomenon linked to a context. Even the talks of the consulted inhabitants somehow directly express certain effects.

Let us take the example of one of the first effects studied. In the psycho-sociological talks carried on with the inhabitants we often found expressions describing some sound situations in terms of "fall", "rupture", "cutting". The structure of these moments linked to quality and time was always the same: a fast transition of a rather strong or durable intensity to a really more feeble one. This process is a very important organizer of the town perception. It marks out the strong limits between public and private, hostile and familiar, as well as a frontier between 2 districts and that between 2 time sequences. This "cutting effect" as the inhabitants call it has spread out in various sectors of culture : music of the whole word, phonetics effects in the theatrical speech, connections in the ordinary way of speaking or in the cinematographic narration. It has a strong power of scansion in arts as well as in daily life. We decided to keep it as a universal paradigm. Other effects have been gradually discovered some appearing more obviously in the organization of the psycho-motricity, some clearly inscribed in the semantic field, some others more connected to space. Some effects were known in acoustics but not very much explored in neighboring fields. For example, what is the anthropological meaning of the reverberation, the mask and the filtering?

In this point of view daily urban life can be considered as the biggest potential supply of sound possibilities, an instrumentarium not only used for an hedonist or ill-fated aim like discomfort (nuisance) but more largely available as the tool of daily human relation.

2 - But, how could we observe a sound effect with some objectivity and at the same time know the space conditions which furthers it? We requested first the field of Architecture and Urbanism so as to put the psycho-sociological information given by the inhabitants, to the test.

If some effects like those bound up to memory or to semantic effects are independent of the physical space, more of them are directly dependent. The volume, the shape, the material straight away determine the propagation of sounds by producing effects such as the reverberation, the resonance, the natural filtering. The traffic planning, the noise of the socio-economical activities, the local customs, the soundmarkers offer the inhabitants other sonic data possibilities or other interpretations of the perceptions. It's the contrivance between the morphology of the constructed space and the sonic sources which produce in the urban environment such remarkable effects as those of the *resonance* or *ubiquity*. For example, the *cutting effect* often lies on an angle of the street or on the clutch of the mechanic sound or on the orientation of a pedestrian walk. Cuttings are of great importance in the sonic geography of a town. Often out of phase with regards to visual and tactile marks, the sonic limits cannot be considered as lines but as interference rings, gradients under time variations.

3 - In this new perspect, what about Acoustics? The clear physical signal is a laboratory abstraction. As soon as it spreads out into a concrete environment, the sound is immediately shaped by the morphological properties of the spot and by the physical circumstances of auditioning : place or mobility. So in the "in situ" measures the quantitative value gives only indications of a part of the sound phenomenon. However, this knowledge is very precious. It often helps to directing the qualitative observations. It allows to forecasting more firmly the acoustic performances of a planned architectural form. To carry on with the example, the analyses of the *cutting effect* points out that the variations of intensity are often linked to the reference level and more, that a modification limited to only a part of the spectrum can be very adequate. So we then analyzed in detail other types of cutting using the frequencies or the colour of reverberation. At last, the notion of "effect" itself finds an ancient definition in the acoustic science. Relying on the theories of the Relativity, a Physics of effects has centered its efforts around theses phenomenon depending on modality as well as on

causality. Some examples in the field of Acoustics : the Döppler effect, the mask effect, the cocktail party effect .

Definition on the Sound Effect.

In fact, the Sound Effect, can't be reduced exclusively to either objective or subjective data. It allows a meeting, an interaction a correspondence between the measurable objective environment, the soundscape of a cultural community and the one, inner to any individual.

In our opinion, the Sound Effect is not just the result of a physical cause. It refers to a *logic of the event*. The peculiar term of "effect" we use can easily take its bearings in the fields of Physics, in audio-visual sounds-effects and in the contemporary stringed-instrument industry. The effect itself is not an object. The conditions going with the apparition of the effect as a whole in a precise situation could describe it. The sound "in situ" never exists without one or several other effects. In the Döppler effect, for instance, the relative speed between the observer and the emitting object characterizes the heard sound. In the effect of natural filtering and the one of reverberation, the particularities of the spatial volume transform the original signal. In short, the word "effect" is very useful and answering to indicate the concrete place and time of sound.

Second characteristic : the Sound Effect is connected to the *interpretation*. The more simple sonic perception necessarily supposes a work of semantic selection. The cultural and social characteristics will add other interpretations. One remarkable effect precisely happens to be the effect of *synecdoche* : one single sound can give sense to the whole remaining part of the Soundscape. This is the case of the soundmarkers described by Murray Schafer. We are never able to hear sounds (in the physical sense of the word) but Sound Effects produced by three kinds of distortions : space, perceptive and cultural.

Third characteristic : a Sound Effect only makes sense by its *expressive dimension*. In the daily space-time, listening is always bound to the psycho-motricity which first helps to adjust oneself to environment then to find its place. A splendid example is given by the *crenel effect* which reinforces the vocal expression of the market sellers with an efficient adjustment of the timbre or of the intensity or of the occurrence. At the collective scale, the sound is a privilege tool for the "*faire de l'effet*" on body and spirit. Sound has no doubt an emotional power that all culture are beneficiary and that all contemporary audio-visual arts use abundantly. So if the effect of ubiquity is very much favoured by the urban shapes it is also one of the most convicting tools used by the political or religious power.

To which class of logic tool does the Sound Effect belong? Is it not exactly a concept but rather a *paradigm*. Half way between the universal and the singular, at the same time model and guide, it allows a general speech on sounds but it can't do without examples. Rather than determining a closed definition of objects, it encircles a category of phenomenon by giving precise information of its nature and function. Moreover, the aspect of the designed object is or modal or instrumental. Abstract notion in the analyses, it is a concrete tool in the creation of the architectural forms. Thanks to these characteristics, it can cross very different fields of experiences and get enriched.

A Repertory of the Sound Effects.

For twelve years the Cresson Researchers have been making a patient and detailed investigation in many fields : Physics and Applied Acoustics, Architecture and Urban Planning, Physiology and Psychology of perception, Sociology and Culture of everyday life, musical and electroacoustical Aesthetics, Literature and audiovisuals Arts. They have registered and described a hundred of Sound Effects. Sixteen basic and transversal ones have been explored and distributed in five categories belonging to their predominant description.

1. The elementary effects. They deal with sonic material and the acoustic modality (*reverberation, delay, filtering...*).
2. The effects of sonic composition directly relevant on space morphology (*mask, cutting, ubiquity, telephone effect ...*).
3. The effects connected to the perceptive organization, to the memory or the culture (*metabolism, asyndeton, synecdoche, phonomnesis....*).
4. Effects of psycho-motricity. Effects which necessarily involve the existence of an action (*crenel, attraction, phonotonic effect...*).
5. Semantic effects : sound effects playing on the variations of sense between the situation and the emergent meaning (*imitation, repetition, Sharawadji*).

What is the use of the Sound Effect? It's a basic *educational tool*. Because of its high transversability between the listening and the making, the Sound Effect sharpens the sense of hearing.

It constitutes a real pluridisciplinary approach of the urban environment. The analyses of the Sound Effects respects the complexity of the "in situ" phenomenon and shows well the interaction between the human, the space and the physical dimensions. The sound embodiment of a society goes through these effects which build up the relation between nature and culture.

Concerning *acoustic measuring*, in the micro-scale, the effects help to choose the right process and to compare the adding with subjectivity.

It is a good tool for the *Architectural conception*. The Sound Effect allows to synthesize a great part of the efficient characteristics of a place and helps to qualify the planning and the sonic cartography. The effects typically connected to space can be straight away predicted; the others can be inferred. They precisely indicate how to create the sound identity of a place.

To come to an end, the published book (and the CD Rom we are now working at) constitute a many directions Repertory. It contains the sufficiently well known effects those clearly described and easy to find or "in situ" or in the hearing. It gathers the classical effects of environment and urban culture. At last, like in music, the meaning of the Effect is long-lasting only if it is really played, performed by actors as well as by auditors too. The set competence is not sufficient enough. Let us be good crickets!

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