Space, and more

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Among the questions regularly put to me, those that recur most often touch upon three aspects, three things to consider that are, truth to tell, unending within the domain of organised sounds. Those questions that take the lead are usually concerned with space – the representation of space as well as the production of space. Then come those that deal with listening, active or passive. Last are those relating to tools for making and for listening. Together, these approaches run through the stages that are very natural in position problematics: where, when, how, for whom, why? I would like, in formulating these repeated questions once more, to make myself re-orientate them in such a way to show that by bringing to bear forty years of experience, I have tried to reply to them as much through practice as through theory, putting forward the idea of a family of operational concepts linked together through the perceptual radical 'acous': acousmatic,[1] acousmonium, acousmographe, acousmathèque.

1. INTRODUCTION

We are well aware that one of the leading characteristics of the twentieth century was the appearance of communication machines,[2] vigorously setting in motion the whole industry of mass communications in the reproduction of the message and of audiovisual information and its diffusion, first introduced by photography, cinema (silent then talking), radio, television (analogue followed by digital). This swift evolution has been heightened across the range of information technology by the change of scale that came in with the personal computer, by the increase in the processing speed of data almost going as far as allowing its completion in real time, as well as by its almost immediate exchange across the world through the Internet.

It is hardly necessary to recall that we are equally aware of how the reception of music and the almost instantaneous production and reproduction of sound has been equally affected by these new operational techniques: the phonograph and the first electro-acoustic instruments. What has come about is that sound – a phenomenon naturally elusive and designed to be forgotten, once merely ephemeral, always linked to its creating gesture – can be captured and thus become autonomous and so reproducible. There we have an object that exists for our perception, because it has objectified itself in its turn. This important acquisition is the foundation of phenomenology.[3]

Does it stay the same, this sound event? One may believe it does, chiefly relating to that trait of our imagination that permits easy recognition, which knows how to tumble with an unspecified origin by the process of referential allusion. Only in appearance – and this is my first proposition, which formulates itself thus: a sound that has come out from a transducer is not a sound like all the rest. Of course, vibrations are carried through the air to my ear, which has the illusion of recognising them, but that is neither here nor now (this is what one would call a 'natural sound' from the point of view of its original space), wherefore it is unique and it is only myself that hears it. With this ghost-like perception, it is necessary to face up and provide a good scenario; and so I have proposed a new paradigm, that of sound image,[4] to which I will revert.

Here, then, space is called into question (because placed in a container) by virtue of an invisible support, an electromagnetic framework thrown upon its reality, fixing it as a sound isomorph (an image object), a fragment of time becomes easy to handle – permanent yet modifiable, like any other object. I will borrow, from semiotics,[5] the metaphor of 'de-clutching' to designate clearly this operation of holophone tracing which proceeds from a global seizure of frequency contours from pressure soundwaves, for holding it henceforth in

[1] An obscure word, taken from the sixth century BC and attributed to Pythagoras teaching behind a curtain. Revived by Pierre Schaeffer in his *Traité des Objets Musicaux*, Seuil, Paris, 1966.
The tape recorder has the virtue of the wall hanging of Pythagoras: if it creates new phenomena to observe, it above all creates new conditions for observation … We discover that much of what we believe we are hearing is only actually what is seen, and explained by the context.

[2] Title of a series of lectures by Pierre Schaeffer, aiming at a theory of mass media. *Les machines à communiquer*, Seuil, Paris, 1970–72.

[3] Husserl takes as a model of temporal object 'that comet's tail', the lingering trace of a melody in the memory!

[4] Cf. F. Bayle, *The Image of Sound* (*L'image de son, Klangbilder*, bilingual French-German, University of Cologne, LitVerlag, 2003–07.

[5] Cf. A.J. Greimas and J. Courtès, *Sémiotique*, Hachette, Paris, 1979 (see 'débrayage' 'actantiel', 'temporel', 'spatial').

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availability, able to be manipulated beyond the circumstances of its production as if it was de-clutched from its initial space–time continuum.

We must note here in passing the reciprocal tie, which unites the space inhabited by the senses and the spatial sense, so that to understand what a thing is, is to work out the space suggested by the dimensions of that thing; and in the same way, listening to it involves a space and a time for the object listened to.

The space of sounds – it is within that concept that the modality of acousmatics functions.

2. ACOUSMONIUM, ACOUSMATIC

The 'associated milieu' that is the foundation of this new music practice, the assemblage of the electroacoustic chain of production (inspired by the techniques of radio), offers up certain functional characteristics that define a work frame: in the place of the piano keyboard and music paper, the studio with its mixing-desk, its machines for editing and processing the sounds themselves, one or several pairs of loudspeakers for control.

At the listening core is the composer. What he makes and his gestures are induced by the effect of aural perception, the spontaneous understanding of his workings by trial-and-error, the successive layers, touches and revisions, creating an invention movement closely related to the organisation of the sound structures with which he works.

I have suggested the term 'modality of acousmatics' to define this state of affairs, based upon the Pythagorean *akousma*, the technique of making an awareness that is established simply and solely from facts of both an intuitive and a creative perception (and by extension 'acousmatic music', its eventual stake.)[6]

We can well see that such a framework may be decisive here. Effectively, it establishes the space for control (the pair of loudspeakers and a central position) where the author–interpreter is beavering away to achieve the working out of a piece destined for a further framework in which it will be heard, namely one enlarged to the size of a public space. Although it may be minimal, this three-sided position works to create the necessary and adequate spatial basis to secure the deployment of sound that we have postulated.

[Perhaps I should recall something here?[7] – that my generation is the one that witnessed the arrival of stereophonic sound. My predecessors, Pierre Schaeffer and particularly Pierre Henry, were composers who came from the radiophonic tradition. And the inspiration of those such as Pierre Henry, very grounded in the materials they used, is in its essence presented from the front, monophonic or at best multi-monophonic. Ten years later, with and because of stereo, which made its mark upon me and motivated me in my turn, it was the phenomenon of 'non-positioning' of objects, their appearance 'out of thin air' on a screen of virtual sound. The resonances of this fascinated me, and it was this that led me to envisage the acousmatic modality as a genre in and of itself – even to the point of its being an exclusive profession. It seemed to me that this quality of vibration continuously stimulates (one may say, exalts) our listening. Moreover, the non-positioning pushes us into a space of representation rich in auditory adventures, impossible to achieve in any other way, thus both confirming it and valorising it as an art *sui generis*).]

The idea of the creation of a specific public listening arrangement (put in place in the 1970s) was for me in large part derived from observing the symphony orchestra, with its standardised ordering, arranged for the best acoustic effects by groupings of instruments and levels of intensity (strings, woodwinds, brasses, percussion). It seemed to me that the complexity of our mixes could only comfortably define itself across an analogue terracing of diffusers of differing calibre, whose positioning all over the stage would assure when in public a large scale legibility, comparable to, and adjustable like, that which was so carefully regulated in the composition studio.

To ensure just such a deployment, I therefore proposed the Acousmonium arrangement. This prescription, very largely adopted, implies that as far as the work is concerned, the control over its translation into the space of the hall, as well as its real time adapted performance to the shared listening experience: in a phrase, a musical interpretation (with its obvious creativity and its compromises, always there to be discussed).

[I often use[8] two metaphors where the Acousmonium is concerned. The first consists of substituting for the term 'loudspeaker' that of 'sound projector' (in this technological and audiovisual age, sound as well as image is 'projected' in the concert hall and in space). The second metaphor is linked to the projection: that of the 'screen'. We know that stereo functions through two channels but only carries a single message. My interest in stereo is that the object-message becomes 'alive' when it is no longer dependent upon one or other of the projectors but goes on to establish itself in immaterial space between the two. Hence the comparison of the screen (current in radiodiffusion to define the control of

[6]Among other functions: radiophonics or audiovisuals, poetics, plasticities or interactivities, etc.

[7]*The Space in Music: Reality or Illusion? (L'espace en musique: une réalité ou une illusion?) Audiovisionen 2004* organised by the University of Cologne, bringing together F. Bayle, Ludger Brümmer, Jean-Claude Risset, Denis Smalley, Daniel Teruggi, for three concerts with the GRM acousmonium – 7 October 2004 – Münster, Lit Verlag (to be published).(From this round table discussion I will allow myself to bring in a number of off-the-cuff remarks useful for present purposes.)

[8]*L'espace en musique* – ibid.

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the modulation sent to the transmitter). Thus described in terms of sound projection and the screen, the system comes even closer to reality as it is perceived. And when one listens to electroacoustic sound trajectories through the air, these pure perceptions are not illusory: the ear discerns at once the movement resulting from the maxima of phase intensity inside the volume of the hall.

Because we now have the instruments, we can also work at the concrete and subtle details. I speak of the technological instruments, instruments that extend nature. In this way, listening to a sound feature that 'turns' in a concert hall has become a natural event.]

3. INTERNAL SPACE – FIGURE – EXTERNAL SPACE

We must stress an important distinction[9] concerning spatial dimension in acousmatic art. The 'internal space' is formed within the work itself, made of reflections of the sonic contours, of the movement of entities, presenting itself to the hearing as a sensation of composed volume. To this we contrast 'external space', with completely different effects, no longer concerned with the work but with the configuration of the space wherein it is heard, with its particular peculiarities (often undesirable or from time to time exploited).

It is thus the critical moment of the transition from studio to concert hall, the 'transposition of space', already conjured up and impossible to dismiss, will consist of the adaptation (as faithful as possible) of the internal space, already arranged within the work, to the external space of the concert hall (according to the resources used in projection and the musical quality of the interpretation).

Incidentally, we must not confuse *space* and *spatiality*: the example of space as an aspect of pitch, or that of timbres, demonstrates that the general idea takes on the dimension of relationship.

[Then[10], if one thinks in terms of space, how is it to be defined? A useful approach would be to describe it as a 'region of influence'. For example, if a point shifts, it influences a space of points, that is, a line. If a line shifts, it defines the space where the line has moved, that is, a plane. If a plane shifts, it defines a movement that reforms as volume. And if volume shifts, what does one see? A universe, one might say – perhaps one can even suggest the concept of a plurality in that universe, let's call it a 'pluriverse'.]

If we accept this as the beginning of the explanation, and apply it to the projection of sound, then already with only a single monophonic projector we define a region of influence, a feeling of space: that of a very near presence if the membrane of the projector exactly delimits the contour of the object, this being very possible with a sound that has been completely calculated, an electronic sound. But opposing this one can also give a feeling of distance, and a monophonic loudspeaker perfectly delimits a space between the near and the distant. In the first decades of broadcasting, the transmission of radio-art programmes produced through a single channel, just as the cinema was completely effective even though silent and only in black and white. (Limits do not circumscribe art! To push beyond them, one improves art; one enlarges the arena of its accomplishment.) With the stereophonic screen, a different effect is obtained (I do not say better, but different): we get an effect of relief, a movement. This is to say that the gradient from far to near is added to a gradient of extension sideways. I choose to use the term gradient which lends itself to the description of values that are continuous and progressive.

In the discipline of instrumental music we have gained the experience of an enclosed space, marked by precise divisions: the scale from low to high frequencies, the harmonic system, the spiral of tonalities. This is a space, but it is well marked out, a space made of divisions, a 'dividual' space, the opposite of the space of timbres, a gradual space where changes occur in shades, as it is with the space of intensities. In the new instance of sound projections, we find ourselves immersed in a gradual system, except when tonic sounds (more or less harmonic) are introduced – with these one recalls the known points of reference in the construction of a hybrid listening, graded and scalar at the same time.

After monaural and stereophonic sound, we continued to increase the number of loudspeakers when multiphonic sound came in. One example is the arrangement of sound recording and its consequent projection in four tracks by Stockhausen (the celebrated system of quadrilateral, in order to achieve the effect of a vortex in motion!). In a certain way, this is serial space, seeing that one can number the series of loudspeakers from one to four. I understand that serial thought, touching upon electroacoustics, has contributed to the lead given to this arrangement of projection, of which the finale is the octophonic cube (two squares superimposed vertically). This is an elegant idea, which establishes itself with the premise of an assumed legibility of 'figures of space' (to give an abstract dimension to space, in lines, spirals and volume) but which implies the resort to simple, or even simplistic morphologies.

Composers in the concrete tradition (using more complex morphologies) have adopted a different attitude relative to the space of projection. We can consider here projectors in pairs (left–right) forming screens: one or two (frontal); three/four, five/six (opening out), and seven/eight (behind, closing down). It is this that determines an effective internal space (following on from that of the studio), and a more convenient

[9]Concerning this distinction, owed to Michel Chion, as well as others also extremely useful, see *L'art des sons fixés, ou la musique concrètement*, Métamkine/Nota Bene/Sono-Concept, 1991.
[10]*L'espace en musique* – ibid.

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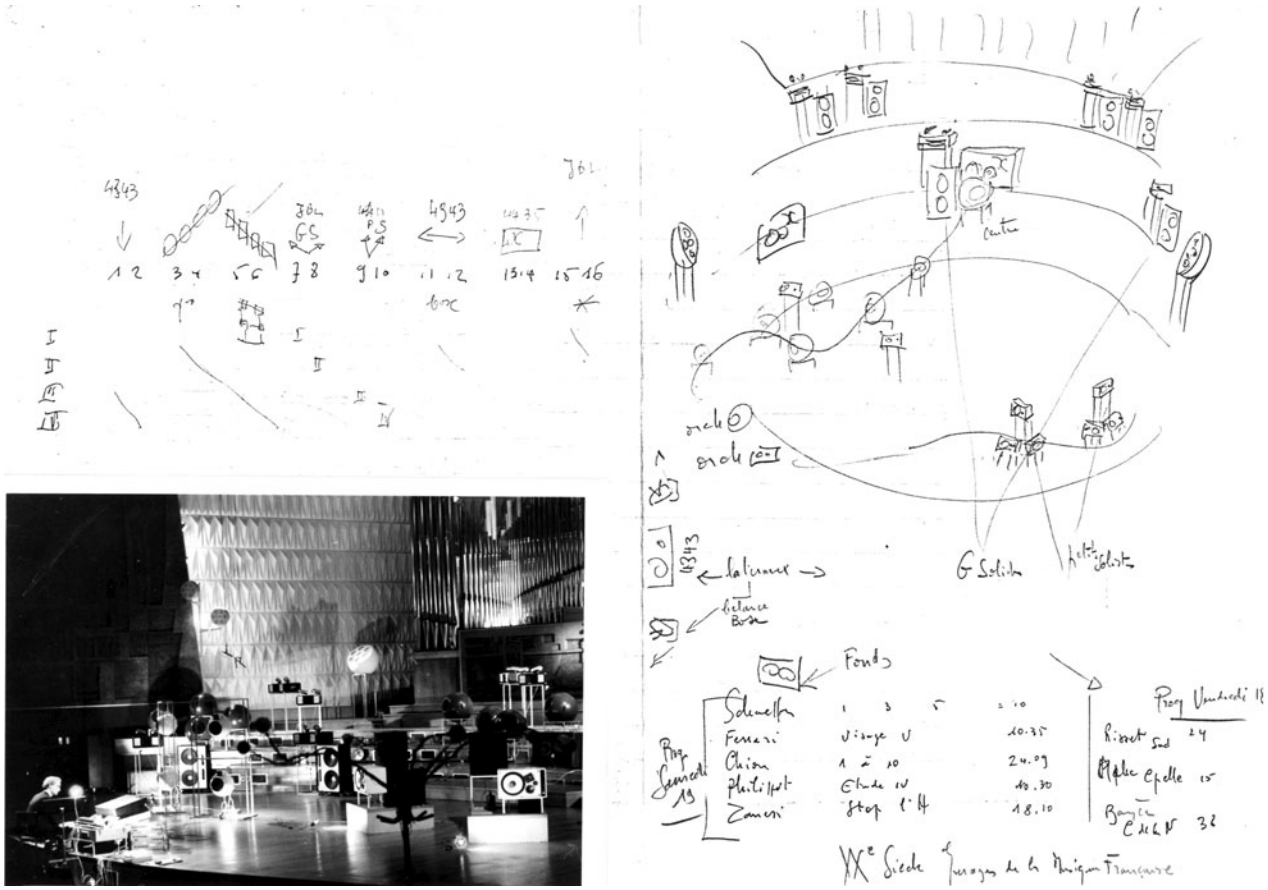


Figure 1. The GRM Acousmonium – implimentation and distribution scheme – *Salle O. Messiaen, Maison de Radio-France: F. Bayle at the mixing-desk.*

way to organise external space – that of the area of the concert hall. At the moment of projection and interpretation, this arrangement will principally allow two distinct ways for your hands to work, activated on several projection screens at once, by mixing or in opposition.

4. SOUND IMAGE

By emphasising the fact that for me, categorically, all sound that emanates from a loudspeaker 'is not a sound like all the rest', I have expressed my wish to show the modality of acousmatics in its true light, to come to a knowledge of a *work on the image*, considering this to be richer in its results than its reduction to a technical extension within the realm of what is audible,[11] through which all reflection is too readily to be found vacant.

The reason for 'composed vibrations' to seem more like images than traditional sounds is evidently the result of the electroacoustic medium and of the system of production/retention which is peculiar to it. To the question, 'What is an image?', let us offer as an answer that it is a trace (permanent or alterable) of a feeling of a reality, the expression of a phenomenological intention.

Whether the object is found or fabricated, the image is adjusted to its function of stimulating perception, of turning to it a face that is real according to the three characteristic aspects of all meaningful tracing: *iconic*, *indexive*, *symbolic*.[12] These three aspects or usages do not mark degrees of image intensity but are, rather, examples of the quality of stimulating a referent. For instance, the sound picture of a stream – the *iconic* detail of its existence, its identifying reality – suggests a certain evocation having the value of a sign, like an undulating stream, a complex of tangled rhythms, which both concretely and in the abstract at the same time suggest the noise of water, but then more like an index. Or as a *symbol*: the archetype of the liquidity of a stream.

The world of the external is not only that of references, however. All forms, decontextualised formations (since these are given to be heard in the space of

[11]For all its innovativeness, electroacoustic instrumentation (synthesisers, captors of change in real time) does not remake the problem associated with the listening experience, even if it enriches it with new sound objects: the local conditions of the traditional system of music, those of the here and now, are held on to.

[12]According to the semiotics of Ch.-S.Peirce, the appropriateness with which we recognise as well adapted to the analysis of the sense of the image.

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projection, and arranged in deliberate networks) can be considered as images (that is to say, symbolic, indexative and iconic traces): a punctuated cloud, more or less dense, a granulation more or less sinuous, a point of sound and its echo, its coloured intensity etc.

The image (or what we may term the I-sound) – an object of pure listening, stemming or not from the real – and detached from all apparent and immediate context – will come to this function distanced from recollection and from anticipation alike, of being an object of language. It then is enabled to play (or sound) all the operative properties of a media art and of a system of spaces (of projection/representation).

To the traditional forms of musical figuration already known will be added those unprecedented which can come about from the dynamic inscribing of the spatial and temporal object, arising from the tooled hand coupled with the percipient quality of invention.

What is new from the creation of inscribed sound, committed to memory, is that listening becomes a form of reading, an 'assisted' mode which supports from some visual information the acoustic effect of anamorphosis (where the listening experience integrates and fuses together incomplete details which escape it). This control over listening, which is practised right from the start (witness the indispensable vu-meter in the middle of the mixing-desk) is considerably developed with the tools of modification that are used, where the graphic interfaces witness an ergonomic inventiveness, by suggesting a heuristic approach (non-parametric) in the behaviour of morphodynamic entities.

That is the reason why, thinking again about the space of representation (and to equip it), I have moved away from the Acousmonium to the A*cousmographe*,[13] with the idea of helping the listening experience through the graphic possibilities of indexation which allow moments to be isolated, and substituting for the unreadable tracings of the sonogram certain deliberate transfers, guidelines for recovering, commenting upon, speeding up and deconstructing from linearity the aural tempo: and thus suggesting a mode that is outside time.

Here we introduce a new practice, that of 'listening–reading'.

This procedure is linked, besides, by a logical consequence of media arts: how may one index in order to consult, classify in order to retrieve, compare in order to renew, exploit, enrich a heritage of thousands of works? This preoccupation is strictly calibrated with other aspects of creation, such as that of conservation (in a sense far from limited to the guardianship of the works), and which will take on a central mission, thoroughly innovative in its considerations (and here only mentioned in passing!): that of an *acousmathèque*,[14] a centre of documentary resources and a nonpareil tool for teaching.

In this way the modality of acousmatics opens itself up, from concrete to abstract, to all the audible forms of narration, arranged as feelings, as emotions, as understanding, in the service of music 'the most general that may be', inscribed and able to be consulted as annotated text, projected and heard as a work of pure listening experience.

5. DIABOLUS IN MUSICA

'All musical civilisation deals with noise by disengaging sound from it'.

It is thus that Schaeffer has shown us in his *Treatise*, what he thought suitable for revising the implied categories that govern and make relative the Western tradition.

This seizing of understanding has been reinforced by the appearance of electroacoustics, which impel a new method of starting and managing sound: the changing of the scale in the study of acoustic phenomena leading to a change in the very language of music.

According to Hugues Dufourt,[15] 'the twentieth century has been marked by the resurgence of dynamic forms of instrumental causation, which have been activated from percussion or from electronic technology … which have given a new life to the energetic aspect of sound. From there, a new æsthetics of sonority' and 'Beyond that, electroacoustics has not only renewed the sort of sensory equipment that we use, it has de-centred it, engaging the listening experience in a sophisticated dialectic of states and transitions. This "stimulated tension" of listening has made a new imperative of sensitivity, as well as inaugurating a different class of expressions of value … this permits changes in continuity without fractionalisation.'

I completely identify myself with these remarks, which well describe the 'morpho-concepts' opened through the field of acousmatics (this is where the yoking together of gesture/matter/instrument are worked out).

These open out perfectly the problem of tension, that division of which relaunches and re-activates that old 'devil in music' – extreme dissonance and the ban on noise!

Coming from a composer whose experience is exercised chiefly in the realm of percussion, I ought to underline the appropriateness of Dufourt's observation

[13]Software tool for the representation in graphics of sound events, created at my request during the 1990s by O. Koechlin, H. Vinet, and recently perfected by A. Lefèvre, under the direction of E. Favreau at the GRM.

[14]The GRM Acousmathèque (launched in 1996) preserves, restores and documents more than 2000 works of acousmatic music, from 1948 to today. Log on to acousmographies at www.ina.fr/grm/acousmaline.

[15]Hugues Dufourt. 1999. 'Pierre Schaeffer: Le son comme phénomène de civilisation', *Ouïr*. Paris: Buchet/Chastel, pp. 73–7.

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when he calculates that 'percussion and the electro-acoustic medium offer us a common characteristic which confers upon them certain similarities and seems distinctive in the music of this century; the one as much as the other profoundly alters the relationship between the production and the perception … and breaks the traditional balance (vocal or instrumental) between the articulation motions and the sound waves that they engender.'

He adds:

> Electric sound distinguishes itself by its plasticity in its space and motion aspect: it allows expansions both abrupt and voluminous, sudden contractions, the making up of force fields or of contrasts. It is not limited either in duration or in density, nor in rapidity of articulation, in any register. It also allows the continuous transition from one parametered order to another. It allows the criss-crossing of categories formerly judged irreducible, from one to another: timbre, harmony, pitch … The electronic instruments also creates a field of hybrid objects which favour ambiguity and equivocation, and enlarges the realm of illusion through sound. … Electroacoustics does not need to take notice of the mechanical laws of damping. It uncouples the functions, and suppresses the rapport of consistency, which used to keep it separate one from the other. Intensity can vary independently of the length, and this allows a play on the dynamic contrasts and to give relief to the provisional qualities of the attack.

Finally, this last comment, which concerns what I call further on the 'hand/ear', a composite organ at the centre of the acousmatic application.

> for the mechanical relationship of gesture/instrument is substituted a neuro-dynamic relationship between the smallest impulse of expression and its electric relay, between the inflow of the nervous system and its translation, its audible result which comes along and adjusts itself to this one particular formation, to this exclusive fashioning of the ear for the reception of unstable forms, which is pregnant with consequences: one can extend this necessary dynamic to music in all its aspects.

In its overall aspect, this objective description causes to bounce back the dualism of predictable abstract and procedural concrete. It lifts up another in its place, that of the field of writing and of the fluidity of gesture, according to a new relationship to time.

Musical inventiveness, which used to be determined by the fixed and reflexive economy of writing, can now leap forward with a spontaneous outpouring of sensory flux, the instant nature of which can in future also return on itself and become fixed.

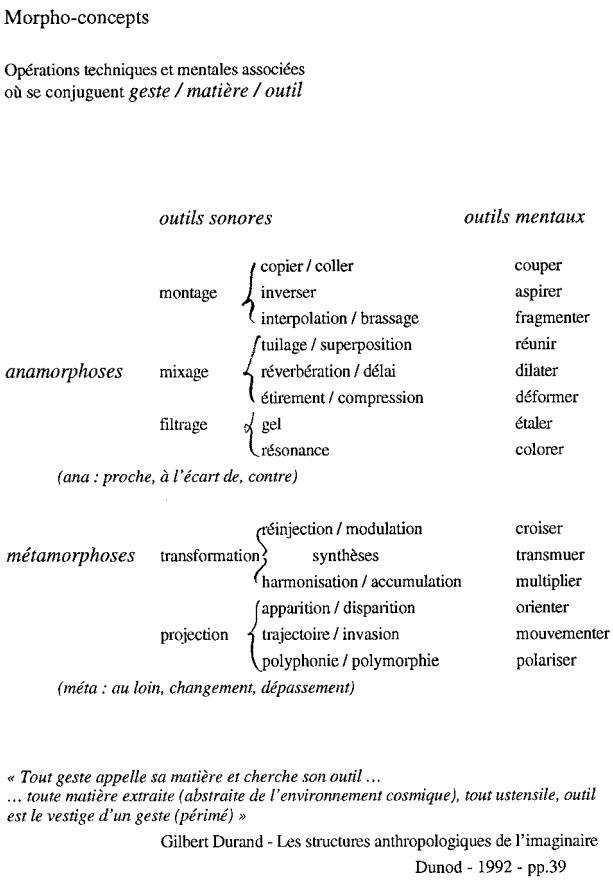


Figure 2. Morpho-concepts: correspondence between operations and tools.

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6. THE HAND/EAR

It remains to be seen how these considerations can usefully interpose themselves and stimulate in concrete form the work of production, controlled in a continuum by its aural reception, inasmuch as the acousmatic modality permits this.

To demonstrate, here are two examples,[16] from two epochs.

The first, *The Acoustic Experience*, is a course in five stages and fourteen stopping places (which occupied me from 1969 to 1972). For me it was both an apprenticeship (of a new occupation, that of a composer new to electroacoustics) and an initiation (into acousmatic listening).

This was a journey in which the matter itself was concrete time, fixed by the machine which objectified the material delivered to the sensory experience. This latter found itself not merely reinforced, but displaced and as it were re-centred by the repeating (to repleteness) of the same listening object. Then the underlying levels of microstructures rose to the surface, partaking of a life of their own and invading the perception, which was modified by them.

For instance, I have found in my notes from that period (1968), concerning the start of *The Acoustic Experience*, this description of the first stages of bringing the project to fruition:

(1) The establishment of an electronic pattern on a smooth and unformed duration, offering internal beats which reach the limit of a jagged disarrangement that forms a dense curtain of intensity, at once clear and opaque, stable and unstable, free from restriction of length, and able to swiftly to close in upon itself.

(2) The establishment of a different process of scalar notes, after the fashion of a songbird's (such as a skylark) long musical cell, characterised by its regular rhythmic figuration (quaver/pointed semiquaver) affected by a final gulp, and by its melodic line broken when descending around a pivotal note. This iconic image (or *im-sound*), about nine seconds or 3m 50 of magnetic tape at 38cm per second, will be put into a loop and arranged in the studio on a system of light pulleys: the reading is repeated fifty-three times (!) and this shape becomes a figure: it will take up the complete time for the work, about ten minutes.[17]

(3) A precise choice of ambiances (natural *im-sounds*), recordings of toads and insects, within opaque and noisy masses.

The problem is then one of making all this material coherent.

The answer is provided by the deployment (recent at that time) of intermodulation (by controlling the voltage), used here like a scrambler applied to the reading of the skylark loop in order to demolish its effect of total clarity.

The game consists in taking in hand a very slow derivative from the song of the bird, modulated from its natural pitch towards different spectral regions, up to the very shrill and very noisy, and more than abundantly swamping these elaborations of sound effects in the dense framing provided by the *im-sounds* of atmosphere.

The perception of the initial shape, that of the bird motif, resists the constraints of the electronic distortions. It becomes a figure (a *di-sound*; di for diagram) and it is because it has been emphasised and the effort deliberately made, whereby one may perceive the shadowy extent of the spectral range, it reveals the map of its painstaking (or fevered) exploration.

The aspect that prevails is one of constant pulsation. It is this that induces a tension in the listening experience that increases right up to the final moment, when the scrambling leaps to the fore. Harmonicity can then happen, like (metaphorically) a goal scored for which it was necessary to wait (or to deserve).

The sense-organ that is brought to bear is very much that of vigilance: excited by the hand/ear that makes by breaking, which explores as it goes along, which follows and leads at the same time, according to a principle of discovery watchful in its search for a pathway through the undergrowth of noises and calls.

What works equally well for me (in my *Expérience Acoustique*, and for a first time listening – *L'aventure du cri*: the alert listening) is the construction, and offering to share with an audience, a process of apprenticeship in which I am involved and that explains myself.

From time to time the hand/ear separate(s). The hand acts alone, given over to the logic of the slide-rule, from the random manner of access with its more or less adequate graduations, for instance the contact button from which unexpected and varied scratchings, accidents and cracklings are sometimes produced. Then again, the hand invents for its part: it skids, seriously deforms the figure that the ear was hoping to guide. The ear falls back, reluctantly accepts the situation, wants to regain its power and direct the workings out when these resist and like an animal on a leash, tugs for its part when it gets a waft of a stronger scent.

Hand and material, gesture and slippage of the idea – that is very much the milieu in which is found at work the artisan that I become, managing sounds that can be complex or elementary, and following the logic of feelings that have come along the thread of their circular listening, repeated without stopping, pulling themselves

[16]Collective work, under the editorship of Horacio Vaggione: F.Bayle, *Manière de dé-faire les sons*, L'Harmattan, Paris, (to be published).

[17]Provocation, or memory of the African bush?

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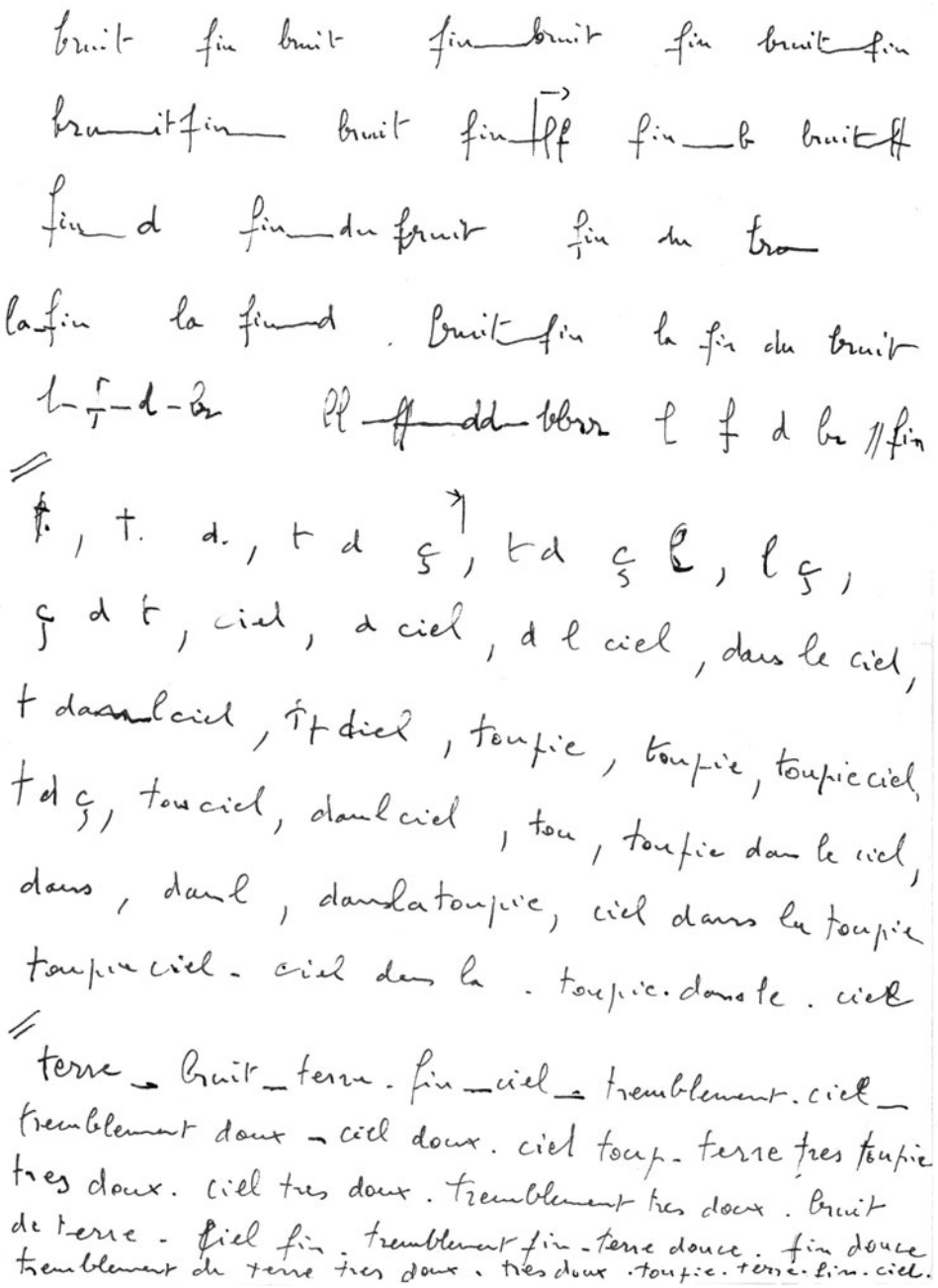


Figure 3. Phonic poem for *Blue Eros*.

up by their accumulation, and then suddenly perforated, exciting the rise of images.

By way of the diagrammatic state (*di-sound*), the iconic object (*im-sound*) changes its direction, dematerialises from its background in order to participate hectically in conflict. Fragments of images or schematic signs which form figures (*me-sound;* me for metaphor) become an abstraction which itself goes to constitute the space wherein music takes place.

Unavoidably concrete at the point of setting forth, the sound image is an object rooted in its own space that from then on, becomes manipulable. In disembodying itself it uncovers other possible spaces, abstracted from the real or meta-real, space-images, movement-images, time-images, where the musical figures specific to the acousmatic music as I am hearing it, move themselves around.

The second example,[18] *Blue Eros*, is a composition from 1980, the technique will be to use the proprieties of a comb-like filter that is very sensitive and precise (this being a digital sound instrument new at the time). The

[18]François Bayle. 2002. *L'image de son – Klangbilder*, Münster, p.124–30.

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resonances of spectral rays at fixable intervals will be stimulated from the setting out of vocal fragments.

Taking the idea of imprinting in the sound of the work itself a personal mark (my hidden presence), I therefore chose my own voice to articulate certain words that bore interesting alliterations (thus: *tremblement, tr… bl…, terre, tr…, très doux, ciel fin, tremblement fin, fin du bruit, fff…, brr…*, etc.).

Recorded close to the microphone, these phonemes at once take on the allure of a sound poem, but that is not the goal in mind. What happens is the opposite, a powerful scrambling of these iconic shapes by way of the filter to obtain spectral masses where transparency and harmonics attract and divert the listening towards a feeling of colour that is not semantic. From the material of the sequences thus obtained, there is an elimination through montage that will only keep those forms that are conferred with the necessary surges, the back-ups carrying harmonic ambivalences, happy accidents.

The ultimate arrangement by layers of fading in and fading out will be conducted, as we might have it, from a 'sky' of sweeping gestures, with breaches in it and whirlwinds about it.

The opening sequences will have offered their resistance here to a universal treatment of the image type (very different from that of the textual dislocation of syllables in modern or serial melody).

The scrambling imposed by the 'filter' tool, all of it working to isolate any tendency to figurative listening, will only have preserved certain indexes in order to redistribute them in the direction of colour accents.

At the risk of spoiling everything, this new capability will have favoured the appearance of fugitive figures that are dynamic and chromatic.

7. IMAGE AND/OR SPACE

To sum up, the *image* (a word which comes from the root *im*, as in to *imitate*) returns us to a referent. This is an appearance, that is to say both things (corporeal) and evocation (mental). And now that we know how to produce such images (by way of technology), it is useful to distinguish carefully between the external configuration of the image–object and the internal configuration of mental images. Thus the image doubles itself, being at the same time object and phenomenon.

And *space* (deriving from *spatium*, a field or arena) takes us back to something stretched out, both as to time and as to distance. Here again is where we should distinguish between the two levels: the one physical and mensurable (that of the extension concerned), and the other, phenomenological, concerning blueprints of the representation of the world of the causation of things (with their degrees of freedom and movements). Space as phenomenon will embrace that of the image; and vice versa!

We must therefore expect that at the call of this word 'image', the fan of packs of figures will open itself from perfect iconicity (realistic or hyper-realistic representation of the concrete aspect of things) to collections of arbitrary forms, identifiable as abstractions, pure signs (decontextualised, dislocated, weaving a skein in fictive spaces).

In parallel with this alert listening, there functions also the significant listening experience. On hearing the relationships, the climaxes, the softening, we integrate them either as agreements or as conflicts, repeats or oppositions, tension gradients, like something that is felt æsthetically.

In the same way that we appreciate (with an interest sometimes tinged with apprehension) a landscape in a storm, the force of the wind on the trees, the whirlwinds, we find ourselves alert and sensitive to the harmony of movements that at the same time are chaotic yet geometrically ordered. Just as things occur, exist, break down into their parts, objects in time, in space, and so on. All is as water runs, flames consume themselves, flowers close or clouds pass etc.

These are universal paradigms.

REFERENCES

Bayle, François. 2003–07. *L'image de son, Klangbilder*, bilingual French-German, University of Cologne, LitVerlag.

Bayle, François. 1999. 'Schaeffer phonogène', *Ouïr*. Paris: Buchet/Chastel.

Bayle, François, Brümmer, Ludger, Risset, Jean-Claude, Smalley, Denis and Daniel Teruggi. Forthcoming. 'L'espace en musique: une réalité ou une illusion?' *Audiovisionen 2004*. Organised by the University of Cologne, Münster, Lit Verlag.

Chion, Michel. 1991. *L'art des sons fixés, ou la musique concrètement, Métamkine/Nota Bene/Sono-Concept.*

Delalande, François. 2004. 'L'invention du son', *Révolutions industrielles de la musique*. Paris: Fayard, Cahiers de la Médiologie/Ircam.

Dufourt, Hugues. 1999. 'Pierre Schaeffer: Le son comme phénomène de civilisation', *Ouïr*. Paris: Buchet/Chastel.

Greimas, A. J. and Courtès, J. 1979. *Sémiotique*. Paris: Hachette.

Roy, Stéphane. 2003. *L'analyse des musiques électro-acoustiques: modèles et propositions*. Paris: L'Harmattan.

Smalley, Denis. 2007. 'Space-form and the acousmatic image', *Organised Sound* **12**(2): 107–26.

Schaeffer, Pierre. 1966. *Traité des Objets Musicaux*. Paris: Seuil.

Thomas, Jean-Christophe. 2000. 'Une segmentation, ou "la langue inconnue" épelée', *La musique électroacoustique*. Paris: Hyptique.

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