# The Instrument in Space: the Embodiment of Music in the Machine Age

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# Abstract

The body exists in space and time. It moves through cultural spaces and temporal rhythms. In the combination of instantiated actions and environmental conditions a context is created, this through embodiment. In this thesis I will attempt to link definitions of embodiment with the process of creating and performing new sound theatre works that involve live interaction with media technology. I will also examine terms such as inscription or incorporation and their application to processes of learning and memory within a particular context of inter-disciplinary skills. Finally, in the light of this genre, I will approach the problematic of analytical procedures that change the very parameters of embodied knowledge.

The term sound theatre could be defined as a shift of play between music, image and text, incorporating elements such as gesture, choreography, audio and visual technology into a compositional dialogue. However this approach demands a re-examination of the spatial and temporal aspects involved in such inter-activity and their consequent relation to the performer. Taking the starting-point of sound and movement within the *body* of the performer, my research involves investigations into medial extensions of embodiment that have developed through a discourse with machines.

This project takes an essentially practical basis for its research in the form of collaborations with musicians and practitioners of media technology towards a creative product. The result is a series of written compositions, each of which examines a different aspect of sound theatre. The valuable exchange that takes place during such a situation of experimentation becomes equally as important as the final product, providing much of the material framework for issues such as terminology and analytical procedures that concern my investigation.

# Contents

# Acknowledgements

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# Introduction

*Embodiment mediates between technology and discourse by creating new experiential frameworks.*

(N. Katherine Hayles 1999: 205)

In a discussion with a colleague and friend from the Institute for Media Studies at the University of Paderborn, Prof. Dr. Barbara Becker (1994), on the subject of the body in relation to music composition, the role of gesture as a springboard for sonic and visual ideas often came to the forefront. Whatever the discipline, the phenomenon of sensitivity in one or several of the senses indicates the importance of the body-being as a pre-condition for creativity. With it comes the memory of sound, for example, so that the meaning of a certain vocal sound evokes an experience stored in the body. Every sign, word, symbol or sound 'before becoming the indication of a concept…is first of all an event which grips my body, and this grip circumscribes the area of significance' (Merleau-Ponty 2003: 273). Terms such as 'formation', 'shaping' or 'moulding' indicate a close connection between the senses and, like the term 'gesture,' point to an imaginative world related to the body that is not only conceptual. Sound ideas are also gestural ideas, crystallized in sketch form then mirrored in notation forms that indicate aspects of their original energy and tension. These are then understood and interpreted by musicians with the help of certain gestural operations. The basis for understanding a score is always connected with bodily experience, this encounter then leaving memory traces in the body that influence the ability to create ones own inner imaginative sound world. Between the body and the sound material an unconscious dialogue takes place, in which the original singularity of the subject reveals itself to its environment.

Michel de Certeau describes this relation between the individual and their appropriation of culture as articulation (de Certeau 1984: 148). Embodied articulation is inherently performative in the sense that it communicates through a gestural form, reflecting both the circumstances of the occasion and the person. It cannot disappear into information. Whereas the body is 'naturalized' within cultural norms, embodiment takes place through an interaction between personal experience and the environment. Inscription is then the normalization and abstraction of the

body into a system of signs, such as the musical score, that are transcribed from context to context after each performance. Incorporation, on the other hand, is instantiated materiality, an inter-play of practice and signs. It is the material experience that deviates from the norms and abstraction of the body. Embodiment is thus an inter-play or collaboration with the body, incorporating its memory, habits, knowledge, and bringing them into a specific context. It subversively undercuts essentialism. Processes of learning are determined either by showing and performing bodily content, or correcting and modulating the performance, often verbally.

In his discussion on the phenomenology of embodiment Don Ihde discusses the different ways in which we experience being both a body and a virtual body in a technological world, defining this in terms of a body one and a body two: the located, active, sensory body and the culturally permeated body (Ihde 2002: 16-36). Within the same person, the former body enacts an experience presented to it, whereas the latter takes on the role of a spectator/listener who watches/hears an imaginary event. Vital to many skills within inter-disciplinary work is the role of embodied learning, offering an inner 'horizon', a contextual and global approach to fluid, shifting patterns of connection, and a transferral between the sense modalities. It recognizes that knowledge is unconscious as well as conscious, and therefore not fully possible to formalize. Pierre Bourdieu underlines this problem in relation to processes of analysis that change the kind of knowledge acquired (Bourdieu 1977: 87-95). Fluid, contextual interconnections are formed into entities, sequences and instructions, the very nature of which are abstract. As a solution he offers the possibility of understanding embodied knowledge without it having to be cognitively recognized as such. Its qualities of openness, ambiguity and change defy definition, pointing to a parallel problem in the analysis of inter-disciplinary work where existing paradigms are not always suitable in their application. Moreover, practice as research in hybrid forms of performance, media and technology is often concerned with new, un-nameable grounds that demand spontaneous and appropriate invention skills in order to allow for their emergence.

The material of my research, new music theatre practice, refers to a historical movement developing out of the 1960s and 70s, where composers such as Mauricio Kagel and John Cage, experimented with non-hierarchical forms of music theatre based on a re-evaluation of the multiple components involved. Parallel

developments were happening in dance-theatre and physical as opposed to word-based theatre, reflecting a cross-disciplinary approach to the performing arts in general. This current concern of mine expands and develops some issues originating from a period of music-theatre composition study with Kagel in the late 1980s, examining them, however, within a strictly contemporary context of inter-medial collaboration, media technology and new forms of sound theatre performance. Thus I situate my perspective on embodiment as a practitioner of this genre, both as a composer/theatre maker and as a performer.

My thesis attempts to examine this genre in the light of more recent events, faced with a diverse number of contributions by theorists such as Björn Heile, Chiel Kattenbelt and David Roesner, and practitioners such as Georg Aperghis, Carola Bauckholt and Heiner Goebbels. My question examines how music can be embodied within this new technological medium. Embodiment means instantiation (from the Latin *instans* meaning 'present') 'generated from the noise of difference' (Hayles 1999: 196), a representation of a moment enmeshed in place and time, physiology and culture — in short, contextual. In contrast to the normative, idealized form of the body, embodiment offers infinite possibilities and experiences that imbricate with each other in a particular cultural context. What then could be its role with regard to movement, gesture, voice, instruments, objects and their relation to new technologies and media, where 'information […] came to be conceptualized as an entity separate from material forms'(ibid: 351)? What terminologies can be used in this particular inter-disciplinary mode in order to facilitate a more embodied knowledge and understanding by all practitioners concerned? New combinations of elements from different disciplines often generate transient forms that defy immediate definition and allow for fresh areas of convergence to emerge. However, given this degree of fluidity, is a system of 'structural analogy' at all possible as a way of working in different media (Heile 2006a: 70)?

To turn to the score-script in whatever form it is conceived, I consider what function(s) it can assume within an altered aesthetic context of new music theatre. Is it there as a basis for musicological analysis (an *Urtext),* as a documentation of the author's intentions for future performances of a work, or as a 'performance text' that considers 'the whole situation of the performance' (Lehmann 2006: 85)? It is interesting that this term, long in use within theatre studies, has only been introduced into the practice of music theatre relatively recently by innovators such

as Aperghis and Goebbels. Essentially it concerns issues such as the relationship of performers to spectators, the temporal and spatial situation of performance, and the place and function of theatrical process within the social field. The word 'text' is used metaphorically by Lehmann to imply a way of considering the parts of a work as being dependent on the whole. A qualitative change takes place with regard to the use of signs and their meanings. The emphasis shifts to one of presence, shared experience, process, manifestation and energy.

Given the three possible functions mentioned above, I am led to consider how the form of a score-script can allow for a transition from inscription to incorporation. Philosopher Roman Ingarden refers to the score as the work's 'schema' (in Nattiez 1990: 69), the musical work existing both in the creative act of the performer and in its foundation in the score. Dalhaus however refers to the musical work as a text, an intentional element that goes beyond notation or performance (ibid: 70). To all extents the crisis of notation witnessed over the past twenty years, due in part to the increased use of audio technology in composition, is no less problematic within this genre. As Nattiez points out it poses the question of the score's role either as an intermediary, a simulation or a pretext for the work (ibid: 79). A work of contemporary music theatre involves music/sound, choreography, design, staging, lighting and other medial elements, each carrying their own associated vocabularies and each constituting an important part. Ideally then, the complete score/script/text would comprise graphic, textual and sound/image material documented in a form best suited to all of the media employed, whether digital, hand-written, or a combination of the two.

By extension, and in relation to its materiality, what other forms and/or roles can the possible presence of a musical score take when placed onstage, besides the purely functional one of referral? Contrary to a scripted play or staged music theatre work, the audience accepts the presence of score pages during a music performance, choosing to focus their attention on the performer and the resulting sound. However this practice ignores the potential of including the score-object as a visual component of the scenography to be interacted with on a dramaturgical level.

My research inevitably addresses the question of how we can re-balance our contextual, relative and specific knowledge of theatre, compositional skills and technology within a situation of experimentation, in order to enable new embodied forms of this genre to emerge: 'Fragmentary knowledge is not mandatory science.

We sense things, we follow a trail' (Derrida in Zielinski 2006: 26). I am concerned here with the possibility of acquiring skills as well as acknowledging pre-existing ones, of challenging 'safe' performance situations in which highly-skilled musicians, in particular, find themselves. As Heiner Goebbels indicates in an essay on the situation of new music today, 'the training of musicians has little than ever to do with current aesthetic impulses and their formative structures' (Goebbels 2002a: 187, 'die Ausbildung der Musiker hat mit den äesthetischen Impulsen der Gegenwart und den diese prägenden Strukturen weniger denn je zu tun'). In order to reach any form of understanding of one's own or others' disciplines it is important to create an *improvisatory environment* in which exchange and learning can take place — in short, a laboratory. Thus the role of improvisation can become a key factor in generating more awareness on the part of its practitioners of these possible, and as yet, unnamed combinations. It would seem vital to apply a method of evaluating the process of a work, a history of its making, as it were, to these questions. This somewhat scientific and academic approach that went under the name of 'critique génétique' (Genette 1988: 27), found its origins in the Structuralist movement of the 1970s, when it was applied to research in literature. It emphasizes the importance of a parallel intra-text that accompanies the actual work during its formation.

Is it possible to set up a meta-discourse between these disciplines, so that they themselves enter into a dialogue on this higher level? In his essay on virtuosity (2003) Nicholas Till poses this question together with that of possible roles, of music as the object and theatre as a possible methodology of research. His argument raises the question of translation between disciplines, of bringing them into communication with each other, so that they come and go as a game. Writing on the experience of cross-disciplinary collaboration, author Siegfried Hüttenbrink defines two possible modes of relation between the practitioners:

> Translation that carries, imports or exports from one side of the river to the other, always throws a bridge. The act […] remains a static, one-way crossing. […] Instead it's about making a detour by means of the other, following each other in parallel from one side of the river to the other. […] Create locations. […] Always maintain a temporal distance with regard to the other, by means of an echo.

> ‘La traduction qui porte, importe ou exporte d’une rive à l’autre, jette toujours un pont. L’acte […] reste un transfert statique, à sens unique. […] Il s’agirait plutôt de cheminer, de suivre en parallèle d’une rive à l’autre. […] Effectuer des repérages. […] En prenant toujours un temps d’avance ou un retard de l’un sur l’autre, par voie d’écho.’ (Hüttenbrink 2009: 91-92)

This brings me to the context of embodied reception. Whether concert-hall, theatre, performance space, or gallery, how can a venue be extended to suit the particular demands of a sound theatre work that calls for a more experiential approach on the part of an audience? A paradigm shift in the definition of the genre carries with it a change of social reception, opening up the field to a far wider, cross-disciplinary public than has hitherto been the case. In this light I will examine how the visual and aural aspects implicitly involved in this genre can be re-connected within the creative process, in order to allow for a multiplicity of meanings in the mind of the receptor, this through an embodied experience of hearing and seeing. Both music and sound can operate on a discursive level, allowing for more fluid connections across the boundaries with visual and text-based arts. An awareness of the balance of creative ideas allows for a sense of communication and shared responsibility amongst the participants, something that is, in turn, transmitted to an audience in its social, political and cultural implications, allowing a much-needed space for personal reflection and criticism. To quote Lehmann, ‘art (is) poetic interruption of the law; […] the political content is implicit in the mode and perception of the work’ (2006: 6).

Finally, the question of embodiment in music within contemporary forms of media-assisted sound theatre is an important one given the rapid acceleration of technology over the past ten or twenty years. Its re-appraisal allows for a dynamic partnership between humans and machines to emerge, replacing a previous domination of one over the other. This would seem essential if any discourse of cultural and artistic value is to result from such an interaction. An understanding of extended embodiment, in the form of the virtual body, only begins with an acknowledgement of the actual body, filled with its own experiential memory and able to situate itself in relation to information technology. Thus, to refer to Hayle’s

quote at the beginning of my introduction, new frameworks are created in order to facilitate interactive communication between the two. The dichotomy of human and machine is replaced by a dialogue based on embodied knowledge and a communication of embodiment that resonates with an audience. I would argue that this shift to the body has happened as a result of the emergent, as opposed to the unified, subject in post-modern society, obliging us to re-define the parameters of subjectivity faced with a vast change in working conditions and tools.

An essential part of this research is the practical element. Out of a process of exchange and experimentation four substantial and fully documented works of sound theatre have emerged. The first, *Zaum: Beyond Mind*, deals with embodied practice as research, in which I become my own vehicle for experimentation with digital sound technology as both performer and composer in collaboration with an electronics composer. The three other works, *Phonurgia*, *PPPPPP*, and *Interweave*, involve other performers whose material I have written and directed, partly as a result of devising processes. Machines, whether mechanical, phonographic or digital, form an integral part of each piece. Close dialogues with audio/visual technicians and collaborative work with a video artist have played an essential role in shaping the performance materials. Video documentation of the performances accompanies a score of each work, together with the relevant audio/visual performance materials. A critical commentary on these works, together with a methodology that examines each one in relation to the main arguments of my thesis, is found in chapters 2 – 5. As a basis for my methodological approach I have chosen issues that are related to Lehmann's concept of the performance text. A conclusion follows, in which I summarize the results of my research questions by re-aligning them with solutions that have emerged from the perspective of artistic practice. Before embarking on the works themselves, however, I will begin by situating these questions within the context of contemporary practice and theory pertaining to the performing arts in general.

# Chapter 1

# Articulating the Space

In this chapter I wish to draw on contemporary theoretical and artistic sources that help to situate my research question concerning embodiment in contemporary forms of sound theatre involving technology within a context of parallel developments in other inter-disciplinary arts. References will be made to practitioners of dance, music, theatre, acoustic art, scenography, design, performance art, and media technology. These disciplines are then brought into a relational perspective by arguments developed from musicology, theatre and performance studies, underpinned, in turn, by some philosophical approaches that enable a deeper understanding of their respective terminologies. I shall conclude with a summary of the issues raised, their relationship to my enquiry, and how they provide a critical framework for the works to be discussed in later chapters.

## 1. A Theatre of Objects

The last 20 years has seen a shift in the use of the term 'theatre' to include post-dramatic theatre (non text-based), performance art and installation, taking as its source the concept of 'happenings' or presentational events associated with the *fluxus* movement and involving composers, visual artists and choreographers such as Heiner Goebbels, Robert Wilson and William Forsythe. The term 'installation', borrowed from the visual arts, has increasingly found its way into text, dance or music/sound-based theatre, for example in the concert installations of composer Rebecca Saunders. As opposed to the *mise en scène* it denotes another, altered relation to the material, one which involves the dimension of space. The stage becomes a continuum of the real, 'where the difference between stage and auditorium does not exist at all' (Lehmann 2006: 122). Framed events or tableaux are situated within these new parameters, enabling a process of radical contextualization to take place. The symbolic, metaphorical principles belonging to the stage are replaced by a theatre of figures, scenic montages, environments or site-specific performance. Many of these have taken their inspiration from visual modes

of perception with regard to logic, direction and shift of focus. Here I emphasize the application of an *aural* perspective to these terms, an aural logic that determines the course of our movements within the space, one that is guided by sound. It directs our hearing, leading us from one area to the next, steering our attention towards sound sources, whether virtual or real. A parallel can be drawn here with sound art and installation-performance based on aural perception, such as the interactive work of Felix Hess, some of which involves the machine's sensitivity to environmental noise as it listens and calls to its counterpart in a 'dance of moving sound sources' (Hess 2001: 6).

Figure 1.1: *Moving Sound Creatures* with Felix Hess, Haren, Holland, 1987. Photo: John Stoel.

The concert installation unfolds itself in the found space, bringing forth a radical contextualization of that space in the case of Saunders and choreographer Sasha Waltz. In their installation *Insideout* (2003), the relation of sound sources and audience depends entirely on the different rooms and spaces in which the former are placed and through which the public moves at will. There is no singular perceptible music, but an interface that allows them to create their own interpretation. Things

are *exhibited* as objects in themselves, the audience transfers its gaze from one to another, no attempt being made to synthesize what is perceived. A changeable relation of commentary between elements such as light, music, text and performers become possible. The actors are placed in this space as 'bodily talking machines, speakers or loudspeakers […], physical megaphones or machine-like instruments' (Stricker 2005: 247, 'körperliche Sprachmaschinen, Sprecher oder gar Laut-Sprecher […], körperliche Sprachröhren oder maschinelle Instrumente'). Another approach to installation, the work of director Robert Wilson, involves an architectonic approach to scenic design, working from visual imagery towards a performance text. Sound often plays an independent parallel role in the overall creative process, as explained by electronics composer Hans-Peter Kuhn, who collaborated with Wilson on the installation *H.G.* in 1996. Pre-recorded environmental sound is placed in different spaces within the installation so that the audience plays the role of the listening actor, moving from one visual or acoustic scenario to another. From the world of dance, William Forsythe linked his background as choreographer to the medium of installation in a spectacular work conceived for the Roundhouse building in London, entitled *Tight Roaring Circus* (1997), whereby the public was invited to enter and move through a huge, undulating, white plastic castle erected in the vast main hall. Along with this shift of physical boundaries between performer and audience spaces and the predominance of visual imagery over the written word, comes the replacement of a linear structure by collage or montage, of metaphor by metonym, and of mimesis by performer presence. Indeed, a paradigm shift has occurred with regard to definitions of the term 'theatre', its multiple forms of practice no longer corresponding to previous theoretical parameters. A pre-existing model has been supplanted by too many exceptions to the rule, demanding in turn the emergence of a new one.

**2. The Body as Instrument**

Expanding on this shift in definition with regard to theatre practice, I refer to the company *Odin Theatret*, directed by Eugenio Barba, who offers an interesting perspective on the difference between theatre and dance in their performance-demonstration *Whispering Winds* (1997). 'Deep dance' would take a scenic form, allowing for the performer's body-mind to become scenically present, whereas

'evident dance' is the pure expression of physical dynamism. In essence, performance is seen as a 'dance of energy and thought' (Barba [DVD] 1997). There is surely a parallel to be drawn here with the energy and thought of performers in a work of sound theatre, and by extension, a link to embodiment. In *The Moving Body* (2000) Jacques Lecoq addresses the need for embodied practice in the creative arts through an understanding of and respect for the movements of the human body in space. In one instance applying his method to the teaching of architects, he cites the importance of involving the miming body in recognising its environment before moving to the creative act. His work with experimental scenography using small model constructions attached to the moving actors, poses a direct link to my research concerning the instrument in space. In essence these mobile miniature designs provide 'a dynamic construction where they [the actors] can place themselves within the space' (Lecoq 2000: 156). A contemporary virtual equivalent of this, discussed later, is the use of scenographic technology on a computer screen. Likewise, Lecoq's development of cartoon mime (101-2), taking its origins from silent cinema, uses gesture to describe the dynamic force contained within images. Operating like a continuous travelling shot, this mechanism of narrative has now been adopted by virtual reality. In terms of its application to sonic gestures, audio technology has realized travelling 'soundscapes' in much the same way.

There is an interesting comparison to be made between *Xstasis* (2004) by Barry Edwards, whose theatre work is often based on all speeds of walking patterns, and composer Michael Parsons' *Walking Piece* (2008) originally based on a piece written for the Scratch Orchestra (1969). In the former we see a largely dramatic component introduced to the movement, sometimes exploring the sheer physical extremes possible on the part of the performers. In the latter they are given a simple score with indications for direction and speed, rendering a 'shape to spaces' (de Certeau 1984: 97) in the same way that music and sound would articulate time. On watching I am struck by an experience of synaesthesia, my mind 'hearing' those lines in space and almost re-creating them terms of imaginary sound. Here the body is perceived as an *instrument in space*.

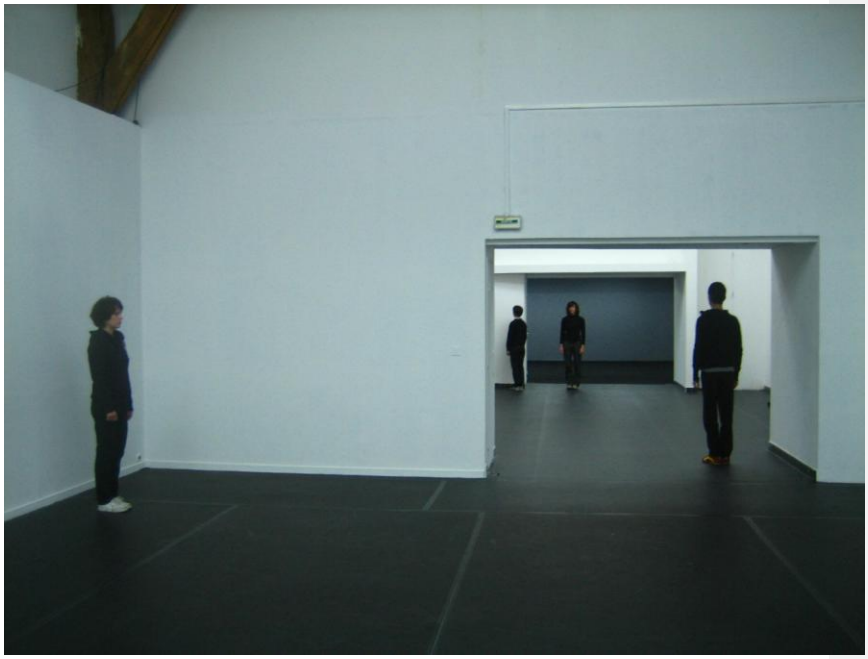


Figure 1.2: Performance of *Walking Piece* by Michael Parsons, Noisiel, France. November 2008. Photo: Michael Parsons.

Space is the basic condition for sound, atmosphere and breath, a produced entity as a result of breathing. Frederic Rzewski, writing on a composition by Kagel entitled *Pandorasbox. Bandoneonpiece* (1960), points to the composer's awareness of space by designating the performer's movements on a rotating stool, thus allowing an audience to hear both resonating sides of the instrument. He remarks that by its very nature the instrument breathes like an asthmatic human being, evoking a 'kinaesthetic sympathy on the part of the audience'(Rzewski 2009: 68, 'der Zuhörer [wird] zum kinästhetischen Mitgefühl angeregt'). A reversal of body-instrument has occurred, the instrument now assuming the properties of a 'body'.

Musical instruments stemming from a tradition that lies outside of the Western classical one reflect a socio-historical background that has to do with migration, economic circumstances, entertainment and oral culture. A case in point would be the accordion, a relative of the afore-mentioned bandoneon, and now fully integrated into contemporary music practice as an instrument capable of producing astonishing timbres that have little to do with its former role in *musicking* (Small 1998). However, our visual associations with the instrument remain, and it is

precisely this acknowledgment of its historical presence, together with an innovative approach to its sound and movement possibilities, that I address. This concern with the recognition of the social and cultural situations from which music making has arisen is echoed by Nicholas Till in his manifesto on a critical practice for new music theatre (2002). His plea is for a relocation of *musicking* within a context that is social and discursive and an emphasis on the performance as an event rather than an idealized aesthetic object. My perspective with regard to musical instruments and machines is essentially performative, involving an anthropological approach to our Western social and cultural performance norms and re-examining their presence as 'object-beings' with a history of all that has been played on them, to quote Diderot in *D'Alembert's Dream*: 'Do you understand any better the nature of motion, or the mode of its existence in bodies, or the manner of its transmission from one body to another' (Diderot 1966: 103)?

**3. The Body as Scenography**

The question of movement leads to that of space with regard to the title of my research, and the roles that scenography, design, media and technology have played in developing this key notion within inter-disciplinary work. In their book *The Potentials of Space* (2006) Alison Oddey and Christine A. White offer a compilation of essays written by practitioners and theorists on recent changes in the conception of creative process within theatre and performance. A theatre as such is no longer regarded in terms of a fixed building or venue but a found, re-discovered space in which the work can be created and presented. New technologies of editing, image projection and sound diffusion enable a 'stage world' in the durational process of performing — in short, enable a *new* spatiality (Oddey and White 2006: 18). A mediated stage can be perceived as an infinitely folded space of possibilities. A time/space structure is set up in the media/theatre space that plays with the relationship between the mirror, a mirror image and the space *within* the mirror. Virtual space remains a dynamic element, constantly renewing itself and shifting positions, so that all parameters of perception with regard to time and space become possible.

I ground the possibilities offered by virtual space in Deleuze and his theory of the 'crystal image' (2005), a notion that deals with time and our perception of the

past in relation to the present. A subjective sense of duration is produced by our own 'internal circuit' (78) of the memory that correlates the past with the present. In the medium of cinema he refers to images that reflect this movement between past and present as a representation of the splitting of time. Transferred to the mediated theatre space a similar alternation becomes possible in the shift between the present of the 'live' and the multiple 'pasts' of the virtual, whether these are realized in the form of images or sound. Furthermore, in *The Fold: Leibniz and the Baroque* (2006) Deleuze develops a concept of the 'fold' that offers an alternative creative approach to the production of subjectivity. Previous definitions of interiority and exteriority on the part of the subject in relation to an object are replaced with a perspective of the inside that is nothing more than a fold of the outside. Applied to the mediatised stage, this is apparent in a close interweaving of live and virtual elements that renders their separate identities indiscernible. Linear development is replaced by a rhizome-like structure, whose parallel events are perceived simultaneously. His comment on the perception of the 'fold' by a visual artist and their audience could also be applied to that of a mediatized performance situation: 'foldings hide from the painter's sight what, once un-folded, they give up to the spectator's eye' (Deleuze and Guattari 1994: 195).

In her essay 'Physicality and Virtuality: Memory, Space and the Mediated Stage', scenographer Thea Brejzek writes about the performer's actual, as opposed to virtual, absence or presence, and the representation of their 'in-between body' as a 'mobile mirror' (Brejzek 2006: 157-171). In this sense 'scenography is no longer ornamentation but rather the body' (Oddey and White 2006: 16). We may also perceive this 'body' as a composite of human and technological resources within a space; or as separate entities, in the form of a computer operator in dialogue with a live performer. In each case an interface can be used that allows for a transferral of embodied experience between the machine and the human body. A virtual space remains dynamic, constantly renewing itself and allowing for all parameters of time/space perception. Within it the performer experiences a sense of *proprioception* — of his/her own body parts in their relative positioning, together with other real or mediatized bodies.

Such a fundamental shift in the perception of the 'stage' has led to the need for a lateral rather than vertical collaboration between its practitioners. Alongside the so-called director came the movement, visual, music/sound directors, together with a

parallel team of light and sound artists, object makers, textile artists and costume makers. Computer technology allowed for a virtual modelling of scenographic interactions, such as lighting and costumes, using two- and three-dimensional images together with time elements. This meant that the production team could determine in advance how the performance would work in real time, maintaining however the necessary transience, instability, multiple framing and interactivity that were demanded by the subject matter. A paradigm shift had taken place, away from building-based theatre to a pluralistic activity focussed on performance. The breakdown of traditional relationships between director, designer, composer and dramaturge are comparable to an economic migration through increased access of knowledge and information via the technology of computation. I would argue that these advances have contributed towards a facilitation of knowledge and understanding across the disciplines, the question being to what extent these virtual *mises en scène* allow for a meta-discourse, based on experiential skills within inter-disciplinary work, to take place.

The possibilities of both multi- and inter-medial interaction within the performance space, using video projection and sound diffusion in real time together with live performers, have encouraged a polymath approach to experimentation. New techniques of performance practice become integrated into new media contexts. The Canadian director Robert Lepage, for example, installs a dialogue between mediated and live images in his Quebec Theatre of Research, one that is often based on a practice of de-synchronization between them. He defines his work as a play with media, rather than a use of it, going along with its conventions and then subverting them (Pluta 2010: 191-197). In *The Andersen Project* (2005) he creates a *mediaphoric body* within the actor, who assumes the role of an intermediary. He stands onstage with his back to the audience, whilst a camera projects an enlarged real-time image of his face, superimposed on to another fixed image, on a screen in front of him. Here three elements are at play in this composite figure: a live presence, a media-related presence, and a metaphorical one that transfers from one sign to the other by means of analogy. The actor's body becomes effectively, 'the *operator* of the stage' (193), combining the aesthetics of theatre and intermediality into a hybrid form. Thus he becomes the pivotal force of a spectacle that takes place by means of the body and its transformation into virtual roles. Scenography, in this visual example of theatre, has become the body.

Figure 1.3: The Andersen Project, *Performing the mediaphoric body* in *Mapping Intermediality in Performance*, Amsterdam University Press (2010), p.193. Photo: Eric Labbé.

**4. A Theatre of Sounds**

The 1970s have seen the development of Acoustic Art as a new media form, 'a symbiosis of […] speech and noise worlds and their acoustic organisation by means of electronic technology' (Schöning 1997: 12). Its ultimate goal is to provide 'a listening space accessible to all: radio and other virtual spaces' (ibid.). Parallel to the world of film it has developed its own language, abolishing the difference between author and director, which was hitherto the case in traditional radio plays. Various forms of inter-medial presentation have also become possible through a connection between a studio realization and a space-sound installation with integrated loudspeaker concerts, simultaneous radio and TV broadcasts or urban/

satellite sound sculptures (for example Bill Fontana's *Klangbrücke Koeln-Kyoto* in 1993). Acoustic Art, in my experience, has a strong relation to the role of sound technology in the reception of new music theatre, implying, as it does, an essentially spatial concept to sonic distribution which can extend to both visual and performance elements. The three radio-phonic works, *Theatri Machinarum* (1994), *Mecanica Natura* (1999) and *Le Fisarmoniche* (2002) that I created with West German Radio's 'Studio Akustische Kunst' were decisive in providing a compositional link between environmental sound, music and text, using digital audio technology and calling for a dramaturgical approach with regard to their relation and placement in time and space. Through a combination of sound processing and mixing, whereby multiple channels are distributed over loudspeakers placed at different points of the performance space, new possibilities are set up within the framework of a sonic scenography. The act of embodied listening becomes the central theme of the medium, an act of discovery, of unravelling the sonic threads. It challenges our habits of seeing and hearing in synchrony (as is the case with the medium of television), allowing room for the imagination to take its own course.

Moving on to sound-based theatre I would like to draw parallels regarding my research question with some recent and current artistic productions. The Munich Biennale of New Music Theatre serves as a platform for composers to experiment with new forms of this genre in works that include Carola Bauckholt's *hellhörig* [*a keen ear*] (2008), a 'theatre of sounds' (Cloot 2009: 38, 'ein Klangtheater'). It explores a world of voices, instruments, amplified objects and sampled sound together with lighting, video and a simple stage set. Here audio technology is brought into a fine discourse with the plastic materiality of live sound sources, the two blending in their timbral similarities. A concern with sound as a physical phenomenon, experienced in close proximity to an audience seated in the round, invites an engagement on both aural and visual levels; the body resonates in response and the ear tunes in to subtle nuances of sound. Embodiment takes place here in the echoed response of the performers to virtual, electronically-sampled sound and extends itself to the perception level of the audience. This is an example of new, as opposed to instrumental, music theatre.

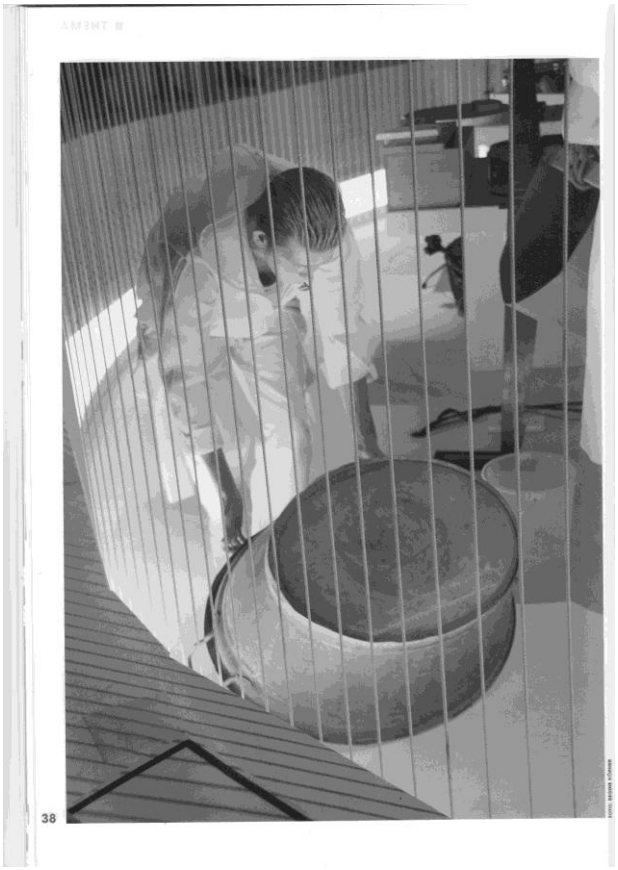



Figure 1.4: Dirk Rotbrust in *hellhörig* (2008) by Carola Bauckholt, Munich Biennale for New Music Theatre. Photo: Regine Körner.

Technologies involved in light and sound play an interactive role in the examples that follow. The American composer based in Texas, David Bithell, has written a number of very different experimental works in this genre, including *The Eye [unblinking]* (2007) for small instrumental ensemble and pre-programmed lighting. It offers an interesting comparison with works such as C*orrosion* (2009) by Marko Ciciliani, a composer based in Vienna, who has researched the relation of lighting to sound in composition. Both play with their synchronization in live performance, but in a totally different way. Whereas Bithell has spotlights directed on the musicians that flash on and off together with sounds or small gestures made by the performers, Ciciliani creates moods and colours with his vast landscapes of light projection around the musicians. In the former the presence of the performers is

punctuated by visual means, in the latter they become integrated into a pulsating 'visual' music with its own virtual body.

Turning to some theoretical perspectives, I begin with an article in *Music & Letters* (2006b: 72-81) by the musicologist and Kagel specialist Björn Heile, in which he reviews three recent publications on new music theatre, one of which I shall deal with later in this paragraph. His closing remarks stress the need to examine this genre as an 'embodied and performative art, as socially grounded action' (Heile 2006b: 81), pointing to a link with other cross-media disciplines such as the ones I have described earlier. Michelle Duncan reflects the same concern in her very comprehensive article *The Operatic Scandal of the Singing Body: Voice, Presence, Performativity* (2004: 283-306), namely to 'lead opera studies away from the clear-cut dichotomy between recipient (subject) and art work (object)' (300), towards a form of public spectacle, a performative event that acts. She stresses the need to render a complex understanding of 'space, temporality and the body's very being in the world' during performance, indicating a presence that is 'fluidly material', a voice that carries remnants of the body with it, so that these remains 'transverse temporality'(Duncan 2004: 303-4).

Composer, theorist and veteran of the cause of new music theatre, Eric Salzman addresses a similar issue to Duncan when writing of 'the body that speaks through the voice' in connection with singer-performers who have totally assimilated technology into their art, such as Meredith Monk and Diamandá Galas (2008: 115). *Musiktheater Heute* (2003), a compilation of writings based on a Symposium held in Basel in 2001, includes a contribution by Erika Fischer-Lichte on Cage's *Europeras 1 & 2* (2003: 283-308). One of the first truly digital works of music theatre in its use of computer-generated algorithmic processes to determine the content and sequential order of material with each performance, its materiality is created anew each time as a unique event rather than a work. Her essay emphasizes the unrepeatability of such performances, each one thus becoming an incarnation of the performative. In this light she calls upon a new *instrumentarium* in order to define an aesthetic paradigm based on the term 'performance' rather than 'work'.

A number of publications by theatre theorist David Roesner include an essay on the increasing musicality of German contemporary theatre (2005: 129-147). Seen from the perspective of a composer I find this approach particularly interesting as it indicates a profound link with new music theatre, at the same time going beyond

any aspirations of a *Gesamtkunstwerk* or 'total art work'. In essence it applies elements of musical thought to speech, movement, sound, image, the *mise en scène*, lighting and scenography by using principles of rhythm, dynamic, melody, counterpoint, polyphony and tempo changes for example. Roesner defines five sound spaces in relation to contemporary theatre that could equally be applied to technologically-supported new music theatre: the *'architectural space'* [author's italics] (130, *'der architektonische Raum'*) or acoustic properties of the space, the *'musical space'* (131, '*der musikalische Raum'*) or specific sound event in the architectural space, the *'placing of sound sources'* (ibid: *'der Tonort'*) or voices, instruments and loudspeakers, the *'sound-room'* (ibid: *'der Klangraum'*) that is composed or manipulated, and the *'tonal space'* (ibid: *'der Tonraum'*) or range and placing of chosen sounds in the musical material itself. Thus the theatrical space becomes a *sonorous* space, a corporeal space, beginning with its overall, architectural 'body', the choice of music and sound to fill that 'body' and the localization of sound objects within it. The term *'sound-room'* refers to the pre-existing characteristics of that music heard together with the acoustic of a particular space. It refers to decisions made regarding its diffusion — such as those concerning live electronic processing — that affect our perception of the music's depth, density and amplitude in the space. Finally the *'tonal space'* refers to the inner 'room' of the music, its use of silence and duration, of line and texture, a structure that creates an imaginary 'body' of sound for the listener.

The audio-visual components that go to make up a work of contemporary music theatre can be allowed to exist independently but not always simultaneously. In his theatre piece *Eraritjaritjaka* (2004) Goebbels prefers to work on the basis of shifting their priorities rather than presenting a simultaneous juxtaposition, in order to let each one 'speak' (Jentzsch 2004). Ultimately their intermedial connection happens in the minds of the audience whose senses are thus free to wander nomadically through a work: 'the uncanny reaches sublime heights whereby our perception of what is real and what is not, what is video and what is theatre […] becomes so elastic that something genuinely profound and extraordinary takes place' (Dixon 2010: 20). The introduction of musical thinking into theatre has led towards further developments of this genre as 'audio theatre' (Verstraete 2009: 26), a theatre for the ear *as much as* for the eye, or indeed of the less abstract term 'sound theatre' (Vear 2009). Sound exists in space and time, occupying a parallel

line to that of the visual action. Verstraete addresses this aspect of theatre with regard to the role and effect of sound on the receptor and its consequent relation to spatiality. Within a sound-led context of performance, he refers to the 'voice-body' that is both aurally and visibly manifested in the entire physical, expressive apparatus accompanying the voice (Verstraete 2009: 165).

Reading a chapter by Goebbels from *Komponieren als Inszenierung* (2002b: 181-184), where he describes the role of electronically-processed samples (or pre-recordings) in his work, I am struck by a parallel with my own experience. 'Found' material, inbuilt with its own contextual background and coming from an environmental source, becomes an element of composition, whether in music, music-theatre or radio-phonic art. It embodies a history within itself, an archaeology, that when analyzed, contains an innate structure. Natural environmental sounds juxtaposed with those of machines take on a different aspect when their respective 'mechanisms' become perceptible through the medium of microphone and electronic analysis. Our acoustic reality is no longer 'natural' as such. We hear 'another nature' through the experience of sound reproduction, through the microphone 'without a consciousness' (Benjamin in Wilkins 2003: 104). In hindsight, I realise that my early fascination with electro-acoustic material was leading me to devise different forms of sound theatre, having first explored their sonic possibilities in purely instrumental/vocal composition and radio-phonic works.

## 5. From the Digital to the Machine Sound Body

### 5.1. The Digital Sound Body

Expanding on my use of the term to include 'digital sound theatre', I shall explore its possible meanings for other contemporary composers and draw some parallels with my own approach. Craig Vear (2009) explores the realm of *acousmatics* in real time and space with his audience plunged into darkness and surrounded by multiple speakers. He describes the term 'sound theatre' as being in-between listening and seeing whereby, according to electronics composer Simon Emmerson 'sound has the power to create its own visual response in humans — a sense of place, of aural landscape' (Emmerson in Vear 2009). In a similar way to radio-phonic art the act of

listening becomes associated with the memories and sensory perceptions of each auditor, the resonance of the physical body to the sound and the sense of acoustic direction becoming very palpable with visual deprivation. Unlike sight, 'sound is *always* in more than one place' (LaBelle 2008: x). On the other hand, this degree of audio intensity, of sound moving across a space of darkness, can be disorientating for the receptor. The eye searches for points of physical location within a shared audience space. To me this kind of theatre invites the introduction of objects or points of light to anchor the public in their perspective of space. A visual, sculptural dimension is awarded, to which their bodies, placed in the centre of the space and facing the periphery of the room, can relate.

Emmerson himself defines the parameters of sound moving in space as 'local and field', the frames within them becoming 'landscape, arena, stage and event' (2007: 98). Whereas he understands these frames in terms of musical discourse, I apply a dramaturgical meaning to their potential relationship of contradiction, paradox, conflict or juxtaposition with other events happening in the same space. Minute sounds that are amplified in a larger space or indeed the opposite, distort our perception of normal acoustic dimensions, and consequently draw attention towards their dramatic meaning. We experience a magnification or miniaturization of the sound that relates, in turn, to other elements happening in the performance space.

Reviewing a number of contemporary operas that have involved live electronics and other media (Klein 2008), there seems to be little perspective on exploring domains outside of the composer-technology field. It has taken performer-improvisers such as Franziska Baumann to challenge the perimeters of electronics and performance by re-integrating the body into new virtual dimensions. This has been achieved by means of direct experimentation with digital tools at institutions such as the STEIM studios in Amsterdam. A case in point would be the interactive *SensorLab*-based *Sensorglove* worn on Baumann's right arm, through which she achieves total control over digital articulations of the voice by means of her own operatic gestures (Baumann 2010: 75-90). Surrounded by loudspeakers she attaches both wired costume parts — glove and hooped crinoline — to her body onstage, thus emphasizing a transformation into a 'digital diva' before her audience's eyes.

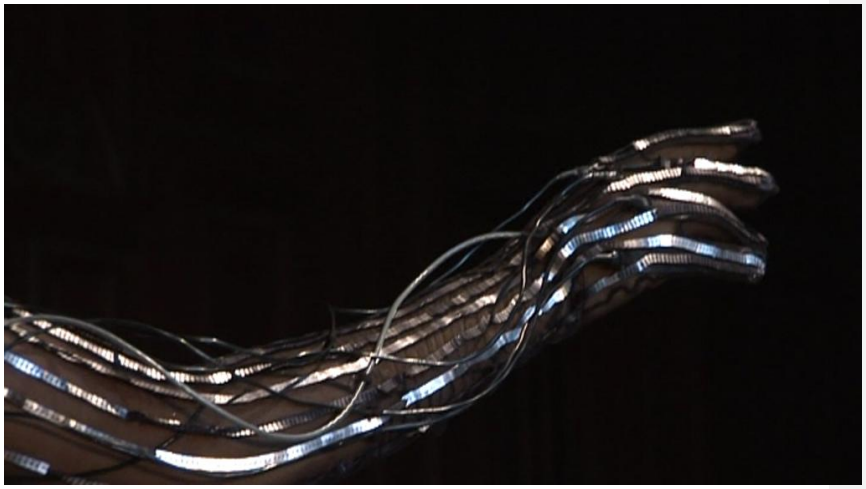


Figure 1.5: SensorGlove, Franziska Baumann. Photo: Simon Baumann, Andreas Pfiffner.

The London-based company, Electric Voice Theatre, under the direction of vocalist Frances M. Lynch, provides ideal conditions for the realization of this complex genre that demands both sound and lighting design alongside other aspects of staging. Recent productions involving voice, live and pre-recorded electronics include *Baghdad Lullabies* (2008), featuring a series of works by composers such as Alejandro Vinao. A predecessor of current embodied research into voice and technology is performance-artist Laurie Anderson, whose pre-occupation always remains with the physical source of sound. Her use of electronic mediation produces both the sounds we hear and a multiple mediated presence, using electronic instruments such as a vocoder or two spatially placed microphones onstage in order to indicate two different character-voices. Expression is achieved essentially through the means of a technology that is 'saturated with electronics and insisting on the body' (McClary 1991: 138). Through her link to performance art of the 1960s Anderson sees the artist as a performing body, maintaining an alliance and identification with the machine as a 'self-directed robot' (ibid.).

Indeed there has been something of a performative 'turn' with the acceleration of mass media over the last twenty years, an extension of a process that was certainly begun at the beginning of the 20$^{th}$ century. Performance has become an 'event' that does not exist separately from its creators and receptors, pointing to a radicalization in all fields of art. Another aesthetic orientation is introduced, in which the presentation of experienced qualities are brought into dialogue with one's *own*

experience as a receptor. Its aim is 'to intensify the aesthetic experience as an embodied experience […], to reinforce the materiality or expressive qualities of the aesthetic utterance' (Kattenbelt 2010: 33). Consequently the staging of a genre such as new music theatre, involving the presence of humans together with virtual realities, becomes a hypermedium. It is interesting that this general move of the arts towards theatre can perhaps be explained by the room that this medium offers to develop a questioning stance towards mediatization. Intermediality (the interpenetration of the real with the virtual), as opposed to multimediality (their juxtaposition), allows for the arts to be staged through a process of self-reflexivity, an approach that is reflected in a critical use of technological tools. Its potential for changing our perception of events on the stage, for allowing new meanings to emerge through their interception, can be far more radical than the parallel, collage-like presentation of the latter.

To return to Merleau-Ponty (2003), quoted in my introduction, the body is the medium for experience. His concept is reflected in much scientific, cognitive and media-theory discourse, according to which embodiment depends both on context and on connective, material interaction. Theorist Jin Hyun Kim (2010: 114) expands on definitions of the term, distinguishing between 'embodying of' ('verkörpern von') and 'being embodied' ('verkörpert sein'). She insists on her preference for the latter as a state in which bodily action is present from the very beginning rather than as a result of an end product. An embodied self is extended and delimited through a digital technology that offers us a network of embodied states of presence according to our participation and agency. We become aware of 'haptic […] space' (Deleuze and Guattari 2004: 421), in which the senses no longer function in strict opposition.

In a work such as *Thespian Play* (2008/9) for saxophone player (without saxophone), video projection and sound diffusion by composer and theatre maker Falk Hübner, we experience the live body of the musician-as-performer playing an instrument that is not present.

Figure 1.6: *Thespian Play* (2008/9) collage. Photo: Falk Hübner.

He becomes a performer, whose actions, as he mimes the play, become unintentionally theatrical. The focus of attention shifts to the body, whilst the pre-recorded and processed sound of the instrument is relayed over loudspeakers together with a previously-recorded video of the same movements. The result is a fragmentation, a separation of each element — the live mime, the music and the image, all of which combine together to create a new constellation.

Another intermedial music theatre work, *Machinations* (2000) for voices, objects, live electronics and video projection by Georges Aperghis, offers similar challenges to the audience. Faced with a fast-moving simultaneity of events, they become aware of their own listening, watching bodies, actively locating the interpenetration of the live with the virtual that takes place before them, an interaction that never loses touch with the corporeal. Live voices improvise in phonemes whilst their sound is manipulated in real time by a visible computer-operator. Projected images of objects handled by the performers are likewise replaced from time to time by his computer diagrams. What ensues is a game of virtuosic rivalry between live and electronically-processed sound, the two fusing in their complexity, to the point where each performer senses the emergence of another extended, prosthetic voice that assumes its own identity.

## 5.2. The Machine-Sound-Body

*…do not seek the old in the new, but find something new in the old.*

(Siegfried Zielinski 2006: 3)

Following on directly from my investigation into the role of embodiment in new media, it is interesting is to discover that there is a keen awareness of integrating and re-mediating both new *and* old into contemporary practice, at least on a theoretical level. However my observation has been that this is occurring more in visual than in sound media (Gruber 2010: 247-258, Zielinski 2006: 255-280). A profoundly important element within the contextual development of my present research is the place of early music machines and sound reproducers. Their re-appraisal has taken a significant turn in recent years as artists became concerned with the 'body' that is lost in digital sound or image recording. It is true that our ears have become unconsciously adjusted to the norm of 'clean' sound or image without re-considering its aesthetic implications, to the point that we now deliberately introduce 'glitches' into digital sound-processing and 'grain' into the film-processing (Kelly 2009: 227-244).

A recent example of an artist-practitioner working in this area is the Berlin-based inventor of music-, drawing- and talking-machines, Martin Riches. The functional materiality of his machines is visually explicit in contrast to the hidden digital information that generates some of their components. In the illustration that follows, a transparent note roll made of plastic and marked with a felt-tip pen is 'read' by the photo cells of a Flute-playing Machine. Amplified signals operate the keys of the flute and the valve controlling the flow of air. Much like the perforations on a player piano roll, additional indications are given for dynamic regulation or sending timing signals to a live performer when playing a duet with the machine.

Figure 1.7: Music roll, 1981, Martin Riches. Photo: Roman März.

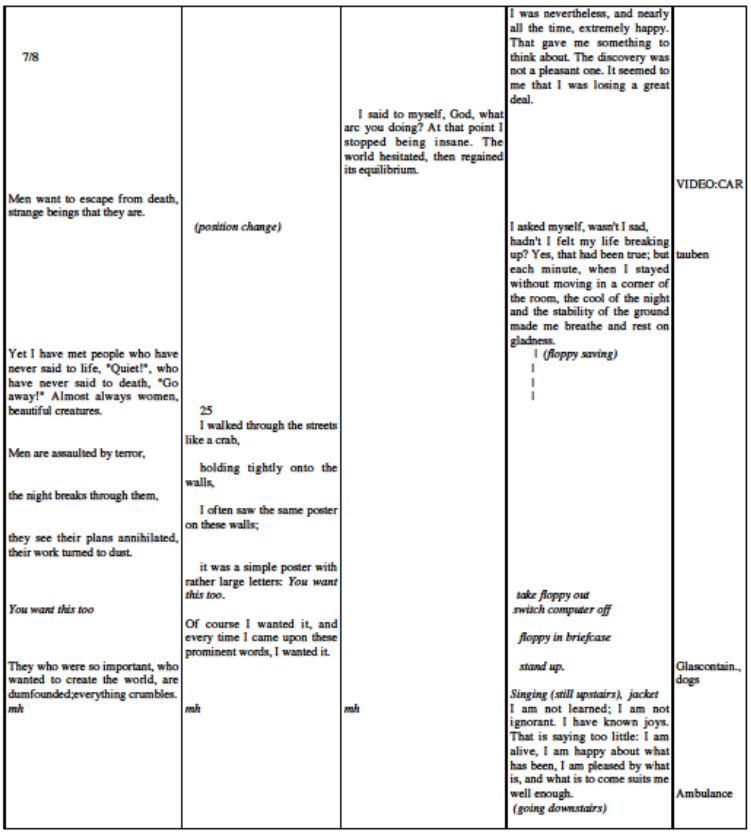
Clearly there has been something of a revival in old sound media technology in recent years, as exemplified in the work of composers such as Paul DeMarini and his *The Edison Effect* (1995). The juxtaposition of old and new sound machines in performance allows for a renewed approach towards the concept of embodiment. Old sound technology offers us the possibility of hearing a 'body' of sound through its undisguised physical source, its context, its presence as such, from which comes its particular diction or enunciation. In relation to movement, gesture, voice, instruments and objects, old and new media pose unlimited possibilities in their modes of discourse: they become visible and audible in an aesthetic of *exteriorization.* I refer to this term as a deliberate reversal of classical Western aesthetics where the process is hidden from the production, a case in point being the pure line of the *belcanto* voice. In contrast, the voice that accompanies Japanese

Bunraku theatre reveals the fleshy mechanics of the throat as the sound reveals its source (Barthes 1984: 170-178). Again the basis of this concept lies very much in the philosophical idea of the 'fold' as evolved by Deleuze (2006), whereby a clear separation is no longer made between the 'inside' and 'outside' of our subjective perception.

**6. One Foot in the Score**

The final issue that I would like to contextualize by drawing on contemporary examples of new music theatre, concerns embodiment in its relation to processes of notation, meaning in this instance the evolution of a score-script that incorporates different media. Needless to say, the parameters of a musical score are changed radically when applied to a hybrid genre such as sound theatre, demanding a re-consideration of each element in terms of its translation on to paper or computer screen. Nevertheless I argue strongly for its continued existence in offering a documentary basis for subsequent interpretations and performances of a work in its vital role as an intermediary, to refer to Nattiez's definition (1990: 79).

Heiner Goebbels offers one solution in his tabulation of libretto, sound, image and stage directions from *I went to the house but did not enter* (2008). In this score excerpt the part of each singer/actor is represented by a column that includes stage directions. The final column is reserved for sound and image indications during a performance, including a video film of a car and sampled sounds of pigeons, a glass depot-container, dogs and an ambulance siren. The text consists of excerpts from Maurice Blanchot's *The Madness of the Day* (1948/1973).



7/8

Men want to escape from death, strange beings that they are.

Yet I have met people who have never said to life, "Quiet!", who have never said to death, "Go away!" Almost always women, beautiful creatures.

Men are assaulted by terror,

the night breaks through them,

they see their plans annihilated, their work turned to dust.

*You want this too*

They who were so important, who wanted to create the world, are dumfounded;everything crumbles.
*mh*

*(position change)*

25
I walked through the streets like a crab,

holding tightly onto the walls,

I often saw the same poster on these walls;

it was a simple poster with rather large letters: *You want this too.*

Of course I wanted it, and every time I came upon these prominent words, I wanted it.

*mh*

I said to myself, God, what are you doing? At that point I stopped being insane. The world hesitated, then regained its equilibrium.

*mh*

I was nevertheless, and nearly all the time, extremely happy. That gave me something to think about. The discovery was not a pleasant one. It seemed to me that I was losing a great deal.

I asked myself, wasn't I sad, hadn't I felt my life breaking up? Yes, that had been true; but each minute, when I stayed without moving in a corner of the room, the cool of the night and the stability of the ground made me breathe and rest on gladness.
*(floppy saving)*

*take floppy out*
*switch computer off*

*floppy in briefcase*

*stand up.*

*Singing (still upstairs), jacket*
I am not learned; I am not ignorant. I have known joys. That is saying too little: I am alive, I am happy about what has been, I am pleased by what is, and what is to come suits me well enough.
*(going downstairs)*

VIDEO:CAR

tauben

Glascontain., dogs

Ambulance

Sy. 3838

Figure 1.8: Score page from *I went to the house but did not enter* (2008), Heiner Goebbels, G. Ricordi & Co. Munich.

A passage from inscription to incorporation is most clearly illustrated in a score of sound theatre that has been largely based on a process of devising. The inter-play

of practice and signs that characterizes the latter manifests itself in the presence of the body, with all of its deviations and imperfections, as an essential component. Fundamental considerations of space, movement and time are made in relation to the sonic and visual content of the work and thus integrated into its written form. In a passage from *hellhörig* composer Carola Bauckholt notates the exact duration of sound samples such as the whale-cries at the top of the page in figure 1.9. These are continued, in a perfect match of timbres, by the live voice of the mezzo-soprano. All of the voices then adopt the same pitch of the violoncellos that finally culminates in a loud outburst from the soprano as the recording finishes. This fine attention to details of timing and timbre reflects an astonishing degree of embodiment, whereby each performer tunes in to the other's sonic production as well as to the pre-recorded material. It indicates a complete integration of audio technology, realized through digital analysis and processing, into the texture of the score.

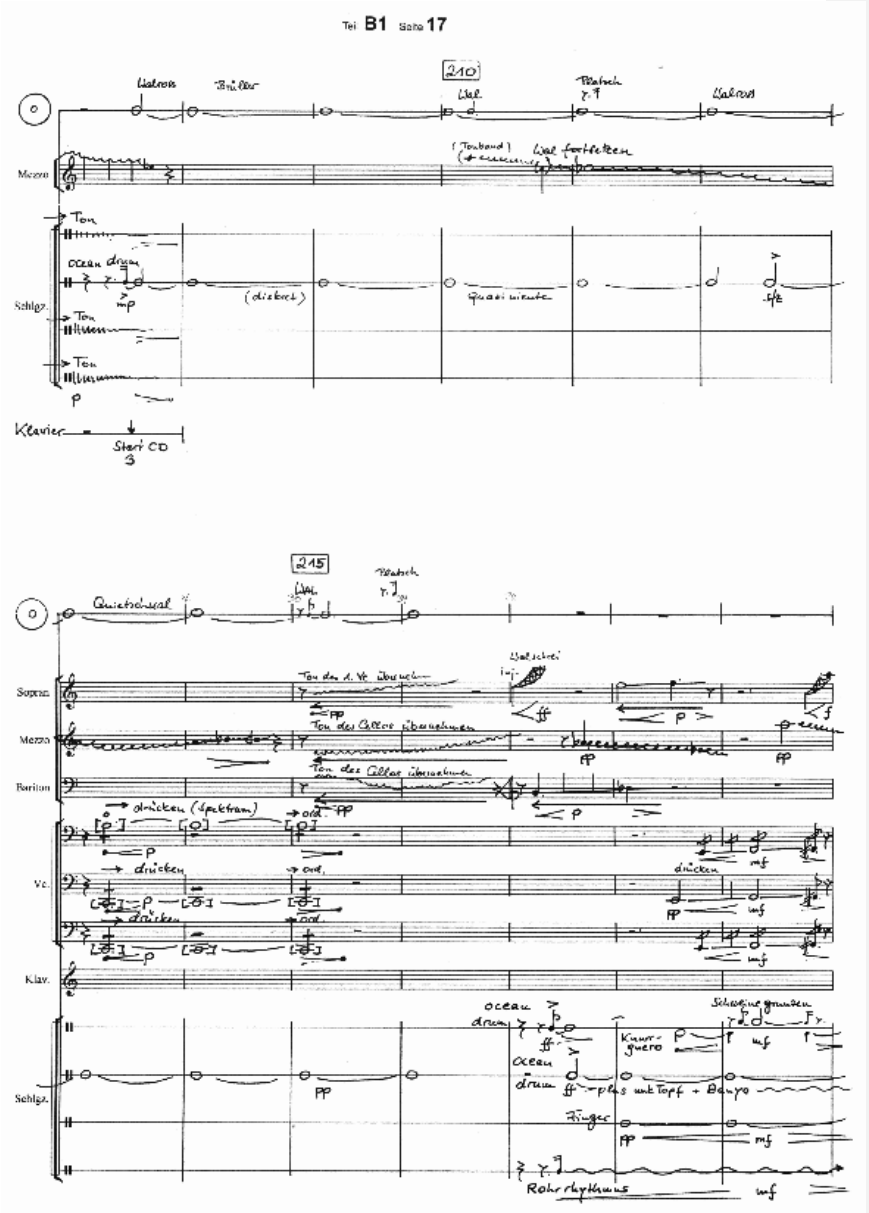



Figure 1.9: Score page from *hellhörig* (2008), Carola Bauckholt. Thürmchen Verlag, Köln.

Composer Falk Hübner faced the potential problem of excluding a performance score on stage in his *Thespian Play* (2008/9) mentioned earlier. Thus, in a process of collaborative rehearsals, decisions were made to keep the notation, in the form of 'finger-choreography', as simple and efficient as possible. This system enabled the player to memorize each movement in conjunction with its imagined sound and to synchronize his movements with sampled recordings during the course of the work. The first entry of a digitally-processed soundtrack, playing samples of the saxophone's lower frequencies, is indicated after the beginning of the piece at the end of the fourth system.

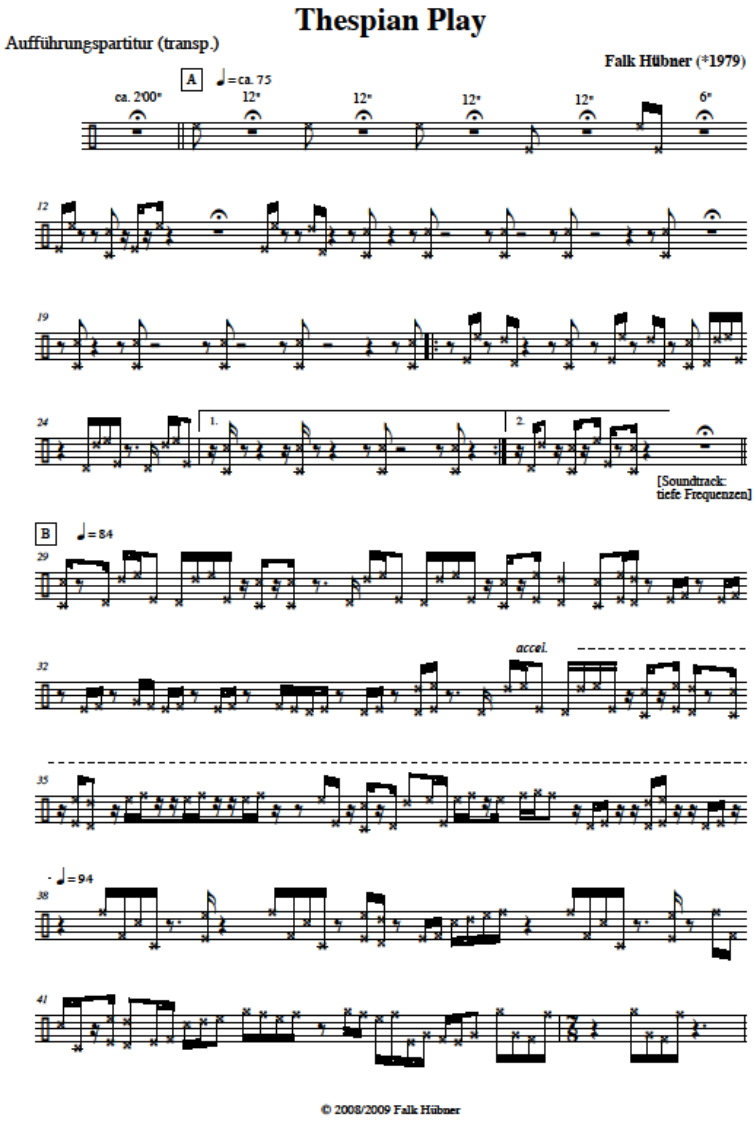



Figure 1.10: Score page from *Thespian Play* (2008/9), Falk Hübner.

My plea for a *performance score* containing all of the elements pertaining to the performance of a sound theatre work calls ultimately for a re-dressing of roles with regard to authorship and collaboration. It requires not only a broad inter-disciplinary

and inter-medial knowledge on the part of the author(s) but also poses the question of collaborative realization when the boundary between the score-script and its *mise en scène* becomes blurred. However, faced with an ongoing crisis in notation on the one hand and a rapid acceleration of media technology on the other it seems vital to re-invent the sound-theatre score in a form that includes the lateral, parallel existence of each component brought into discourse by means of the body.

Seen in relation to my research question posed in the introductory chapter, I have explained reasons for my choices of focus and thus prepare the ground for discussing some artistic works as a vehicle for exploring these theories. Firstly, many of the issues concerning music or sound and its embodiment are linked to those pertaining to music and theatre practice — namely the potential of the body to move and make sound. Any extension in the form of instruments, objects or media technology is based on this fundamental relationship. I have examined the potential of re-integrating this body, saturated with its own cultural history, into a critical dialogue with both new and old forms of technology. Terminologies that can be invented to support and facilitate such an understanding are drawn from different disciplines such as sound art or scenography, and brought into a structural analogy with each other, whereby the question of a meta-discourse between them, in the form of a common language, is opened up. Vital to the link between inscription and incorporation is the role of a score-script in hybrid, inter-disciplinary forms such as music theatre. I have pointed to the contexts of documentation, performance and readability with regard to its relevance in contemporary practice. Analytical procedures when dealing with technology, sound and space do not always recognise the factor of unconscious embodiment, an observation emphasised by Ihde (2002: 28), its possibilities of existence being dismissed by overriding paradigms that rest on a cognitive level of understanding. In this light I stress the need to approach learning from the basis of embodiment in order to understand other skills within inter-disciplinary work, a point that will be made in the next chapter with regard to both practice and experimentation.

# Chapter 2

# The Digital Instruments

## 1. *Zaum: Beyond Mind*

*Digital technology has merely reinforced the importance of the human body and the physical in live performance*.

(John Richards 2008: 25)

This chapter is dedicated to embodied research involving a collaboration with composer Oded Ben-Tal, from Kingston University, that culminated in a sound theatre composition for voice, bandoneon, live electronics, pre-recorded sound, choreography and lighting entitled *Zaum: Beyond Mind*. As both composer and performer I became my own vehicle for responding to and testing the practice of interactive electronic sound in order to evaluate and critique results of experiments from first-hand and thus develop the material on a compositional level. All this would not have been possible without the collaboration of another composer specialized in the field of music technology, creating a situation of exchange and dialogue that indicates, in turn, a shift from traditional working processes. The initial context of our work stemmed from the Design and Performance Laboratory at Brunel University, where we could explore the interaction of live and virtual sound using different forms of amplification. Material developed for the purposes of a large, complex installation-performance entitled *Ukiyo [Moveable World]* (2009), a choreographic installation conceived and directed by Johannes Birringer, soon manifested itself as ripe for further exploration. A guiding line in this chapter is a statement by vocalist Julianne Klein, whose thesis on voice and live electronics (2008) was briefly referred to in the previous chapter. She underlines the importance of refuting pre-existing artificial social constructions and genre distinctions within the arts faced with the evolution of digital media. In their place she proposes a 'cooperative, humanistic effort to produce inspired and thought provoking digital media relevant to the new century' (Klein 2008: 19).

### 1.1. A Digital Environment

The piece comprises various modules or movements that can be performed in any order or selected according to the performance conditions and context, as a *living* piece of sound theatre. Two performers are involved, together with live interactive electronics, pre-recorded material, voice, bandoneon, choreography, a small stage-set & lighting. The software actually operating during performance is Pure Data (Pd), created by Miller Puckette during the 1990s, an open source programming language used for multimedia works and interactive computer music. It was designed to provide the features of the earlier developed Max and FTS (Faster than Sound) but with some improvements on the original model.

Comment [c1]: No apostrophe

As for the hardware, placed deliberately centre-stage, it consists of a sleek laptop and sound-card on one small table, a wireless receiver at its foot and countless wires hidden underneath. This poses a bizarre contrast to the 19th century bellows instrument standing on its end on a parallel table, their only physical connection being a length of wire that promises to bring them into a temporal dialogue. There is a deliberate reversal of the tendency to hide a technician-performer seated at a computer; in fact the presence of the laptop without operator, playing itself as an animate instrument, is also explored. From a theatrical point of view the character of the silent, subversive second performer is essential to the play of dramatic tension that ensues. Up to six loudspeakers may be used in the space, a contact microphone attached to the bandoneon and a wireless microphone to the vocalist. The audience are seated within the circumference of the speakers, thus perceiving the spatial distribution of the sound together with the physical proximity of the performers as they move through the gangway of a thrust stage. Different intensities of lighting on each space suggest changes in mood as the memories evoked by the main protagonist come and go. The vocal material is loosely based on *zaum*, sound poetry from the Russian Futurists of the 1900s, an era that also heralded the beginnings of electronic instruments as both music and words evolved towards new dimensions of sonic exploration.

***Zaum in Tiflis***

***1917-1921:***

**KRUCHONYKH**

```
pale are all
             the lands
       and red
             the noses
       i alone am sev-
             ere
             and black
             like
                   a plaster



             thing fragment
             mindfragment
                         speech -
             fragment

       Let-
                   -terfragmen

                                   -t



pleasing the plague
                 of her husband   Lazhila

lived on the Zhil
            crops of banter

                                Great
```

Figure 2.1: *Zaum in Tiflis*, Alexei Kruchonyck (trans. G. Janacek).

The original musical material is largely taken from pre-recordings of vocal and bandoneon improvisation, both sources undergoing some real-time electronic processing and additional synthesis, such as physical modelling, of their live sound. The score comprises a wide variety of notational forms that encompass music, electronics, gesture, dramatic indications, text, scenography and introductory explanations for each module or scene. In their present form the Pd patches can be downloaded, the fixed sound files existing as separate entities.

**1.2. From the 'old' to the 'new' instrument**

The bandoneon was invented in 1845 by Heinrich Band in Krefeld, Germany, as an improvement on the already-existing concertina. It is essentially a tactile instrument, with two resounding boxes to the left and right of a long bellows. Essentially it is anthropomorphic, functioning only by means of air like a human being, and producing a raw, reedy timbre. A form of 'new virtuosity', a term employed by the pianist and composer David Tudor, reflects my approach to the playing techniques involved with such an instrument. Born out of a Dadaist negation of the old aesthetic, 'new virtuosity' embraced the 'clumsy, the repetitive, the involuntary, the invisible' as its avant-garde signs, whereby the 'gestures against authenticity' were, in turn, eventually 'refigured as authentic' (Till 2003: 4). In contemporary music practice it involves a re-discovery of sound by other means than the conventional training offered by traditional methods. The processes involved indicate a more lateral, rhizome-like structure of thinking. Virtuosity's philosophical basis has changed, indicating a paradigm shift with regard to former points of reference. A different relationship is proposed with regard to sound, space and time on the part of the practitioner and the receptor.

I devised a system of mapping the complicated key systems on either side of the instrument. This sets up a relative sense of pitch combinations that the fingers locate according to their patterns and distances on each fingerboard. It also takes into consideration the added factor of a different sound being produced according to whether the bellows are drawn or pushed. Such a method defies all traditional instrumental learning, suspending the notion and confines of exact pitch notation, and offering a great deal more freedom to the player. It still remains possible to notate by means of an open-stave system where pitch ranges are defined according to their vertical space on the page. Intrinsic to the mechanism of the bandoneon is

the time it takes to react to the pull/push of its bellows, the air stream carrying the sound from reeds opening and shutting inside the casing. There is a certain attack/delay effect, a link with the human in-breath/out-breath, an effort of difficult breathing. The instrument creates and discovers space through its breath. It 'inspires', blows in, breathes. Player and instrument become one in a mixture of organic form and object, constantly changing roles. Their relationship is essentially intimate.

Naturally there are limitations with regard to the technique of actually playing the instrument when extended movement positions are used, a factor that points to the new virtuosity mentioned earlier, where unorthodox playing postures challenge the performer to extend their concept of instrumental technique and explore the possibilities of sound production in new, inventive ways.

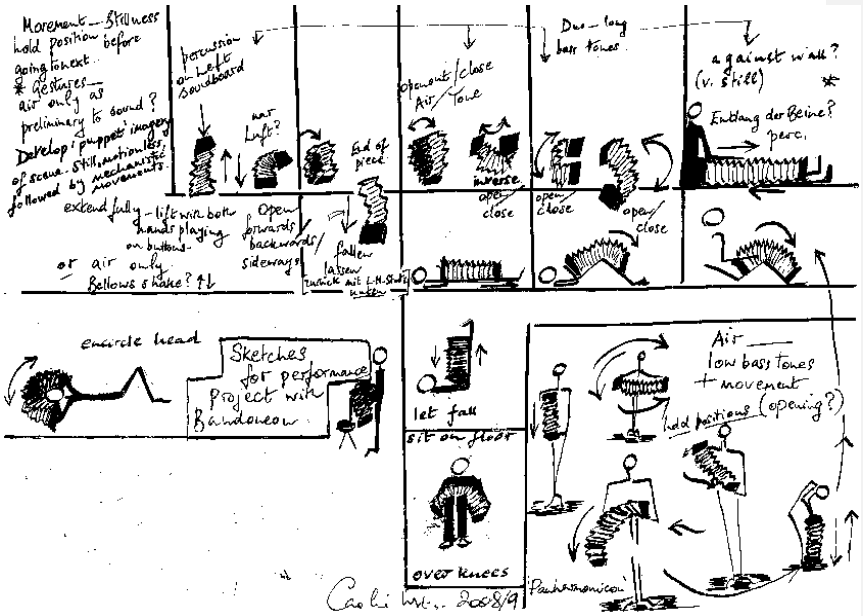



Figure 2.2: Early choreographic sketch for *Zaum: Beyond Mind*, C. Wilkins.

An interesting parallel can be made here with choreographer William Forsythe's statement on his work *Decreation* (2009). Operating deliberately with the principle

of *dis-focus* — a loss of physical orientation on the part of his dancers — he demands oblique counter-rotations to their movements that engender a sense of physical 'blindness'. Straining limbs and contorted positions go against their embodied classical training, heightening the body's proprioception, or sense of positional relativity, by disturbing the sense of gravity. The focus is no longer on the eye to guide one's movement but other, less-used senses pertaining to the body, such as the haptic sense. In both cases the classical training of musicians and dancers is de-constructed, allowing in its place an extension and re-discovery of technique. It relies primarily on the exploration of movement or sound and the invention of new techniques as a consequence, as if one had *un-learned* any previous training.

During preliminary recording sessions Oded and I discussed the possibilities of incorporating samples of pre-recorded sound from the bandoneon as the basis for the live electronics, developing and modifying the original instrumental timbres and amplifying some of the live instrumental percussive/air sounds so as to make them sufficiently audible during a performance. The live electronics would respond to certain pitches and timbres produced by the instrument, triggering off a palette of extended sounds and filling a longer silence with air sound. They open up the possibility of another dimension of space within live musical performance, that of a virtual presence together with the physical presence of an instrument  The choice of material was determined by an essentially experimental work process, whereby Oded suggested certain timbres and registers such as low, sustained bass notes, chord clusters in the middle range, very high pitches, tremolo produced by rapid bellows movement, and percussive sounds produced on the body of the instrument.

We examined many technical and musical possibilities of playing, including all manner of extended sound such as air, key- and hand-percussion; this by means of structured improvisation, incorporating the ideas into a flow of sequences that made musical sense. Interactive experiments were set up between the Pd programme and the live bandoneon, testing the reactions of the former to various instrumental pitches and timbres, and adjusting the patches so that they responded more markedly in order to allow a 'control intimacy' (Emmerson 2007: 96) on my part. By watching the movement of a patch on the computer screen I could determine the degree of reaction to a particular sound, which in turn affected my choice of speed

and dynamics in a process of sensitization that demanded flexibility on both sides to allow for this dialogue, this play, to take place.

### 1.3. The voice-instrument

At this point I refer to Susan McClary's comprehensive essay on the performances of Laurie Anderson, quoted briefly in the previous chapter (McClary 1991: 132-147). The voice is treated as an integral instrument of the performing body, insisting on the physical source of its sound. This is a very different aesthetic to the operatic voice whose technique of production masks its process, Anderson's approach stemming directly from popular culture with its combination of speech, song and long tradition of electronic amplification. Thus both body and machine are combined in a fine process of mediation through a use of technology that has been developed over years. It is her extension of the voice-as-instrument that interests me with regard to *Zaum: Beyond Mind*, offering the possibility of multiple mediated presences through the creation of virtual voices but never losing touch with the *body* of the voice in its interaction with electronics. By means of a wireless head microphone live electronics respond to my speaking or singing voice with sampled sounds recorded from the instrument and modified. I notated an open score of the vocal part as a basis to work from in the same way that Oded had written a virtual 'score', in the form of a patch, for the live electronics.

We considered the use of multiple scenes within the performance, consisting of pre-recorded, electronic and live materials that collide together as virtual and real worlds creating dramatic spaces; to dislocate the visual/aural synchronization of the voice in order to allow for these spaces to be generated. The vocal performer could listen to autonomous, pre-recorded voices, her visual presence on stage being a creation of these sounds. She could hear her own voice(s) returning as a ghost (pre-recorded, electronically processed), adding perhaps a counterpoint of commentary with totally unrelated, different live vocal material or mouthing a response. The 'voice(s)-off' corresponded to several virtual characters, the same applying to the bandoneon part which could be extended into multiple electronic virtual instruments. Amplification of both instrument and voice magnifies the internal workings of each, such as air, key clicks or breath sounds, and gives them a larger, macrocosmic dimension within the overall sound-space. Thus our sense of acoustic perspective is altered.

### 1.4. The computer-instrument

Taking original sampled material as a starting point for electronic modification and recognising the importance of characteristic timbres stemming from these recordings, results in a palette of virtual sound that retains its own distinct embodiment. The connection lies in musical *gesture*, something that is embedded in the electronic results generated by the computer-instrument. To quote Jonathan Harvey, 'When electronics are seamlessly connected to the physical, solid, instrumental world an expansion of the admissible takes place and the "mad" world is made to belong' (1999: 80).

From my perspective, the process of performance involves interacting with live electronics in an embodied form. Working closely with responses to one's own generated sound became a fascinating and highly complex affair, demanding a strong sense of timing, of acting and reacting to my electronic virtual counterparts in a constant flow of dialogue. There is also an inherent sense of play with the live electronics, of imitation and variation, an interaction between playing an instrument or vocalising and rebounding from the response. As a performer I maintain a dialogue with the material in the process of which there can, and should be, some unexpected results. But this live situation demands multiple listening and responding tasks. Because of the nature of the modified sound source a certain distancing takes place when I hear it in relation to my own sound. This spatial-sonic voice/instrument is strange but somehow related. I am communicating with a familiar source that has become an 'other'; displaced, altered, its changed character has taken on a fragmentary, other-dimensional aspect as the *electronic woman-voice/instrument*. Interesting is to further delimit that borderline during performance and modify the already modified live electronics, this by slight shifts of instrumental and vocal colour, so that the resulting sound sequences are constantly changing, subtle and complex, like multiple mirrors. However, it seems vital to maintain an observable connection otherwise 'the dramatic relationship will be lost to the audience' (Winkler 1998: 9).

The possibility of working directly with the patches created by Oded has made an enormous difference to my understanding of their function and response capabilities. The importance of *playing with* various timbres, such as voiceless fricatives, whistles, and vibrato control, cannot be overestimated. In particular the

time-roll indicated on the patch, a small screen showing graphical duration and pitch curves, becomes a visual aid to the audio input for the performer during a developmental rehearsal process. The degree of sensitivity to any small audio input is impressive, so that a control intimacy on my part seems entirely plausible. Essentially, this patch has a characteristic, like any structured compositional material, which I would define as playful and humorous. Its presence has become more ample after our initial experiments to determine the degree and length of responses, meaning that the electronics take on more of a substantial role as an independent body in the overall sound design. I read a patch like a moveable score, adjusting its parameters and occasionally examining the pre-construction of a single sound that goes to make up a small portion of the diagram.

Now that there were two kinds of score material to juxtapose, the one notated in open form as sketches, the other encoded in its own complex electronic design, the task remained to explore their potentials and analyze the combined sonic material, documenting these results for further experiments. This process recalls a reference made by Nattiez to the 'ex post facto transcription of experimental music' (1990: 73). As opposed to prescriptive notation (Seeger in Nattiez, ibid.), normally used in the final stage of composition, transcription is a valuable tool for analysis. In its application to improvisation this method allows a comparison between the graphic trace and the model of reference, where hitherto unknown relationships within the musical material become clear.

**1.5. Analyses**

Throughout the working process I examined my analyses of the live and electronic sounds notated on score paper in order to define the electronic sound components involved. Notated analyses of recorded excerpts from improvisations were documented throughout, a comparison between which revealed greater complexity in the patch structure.

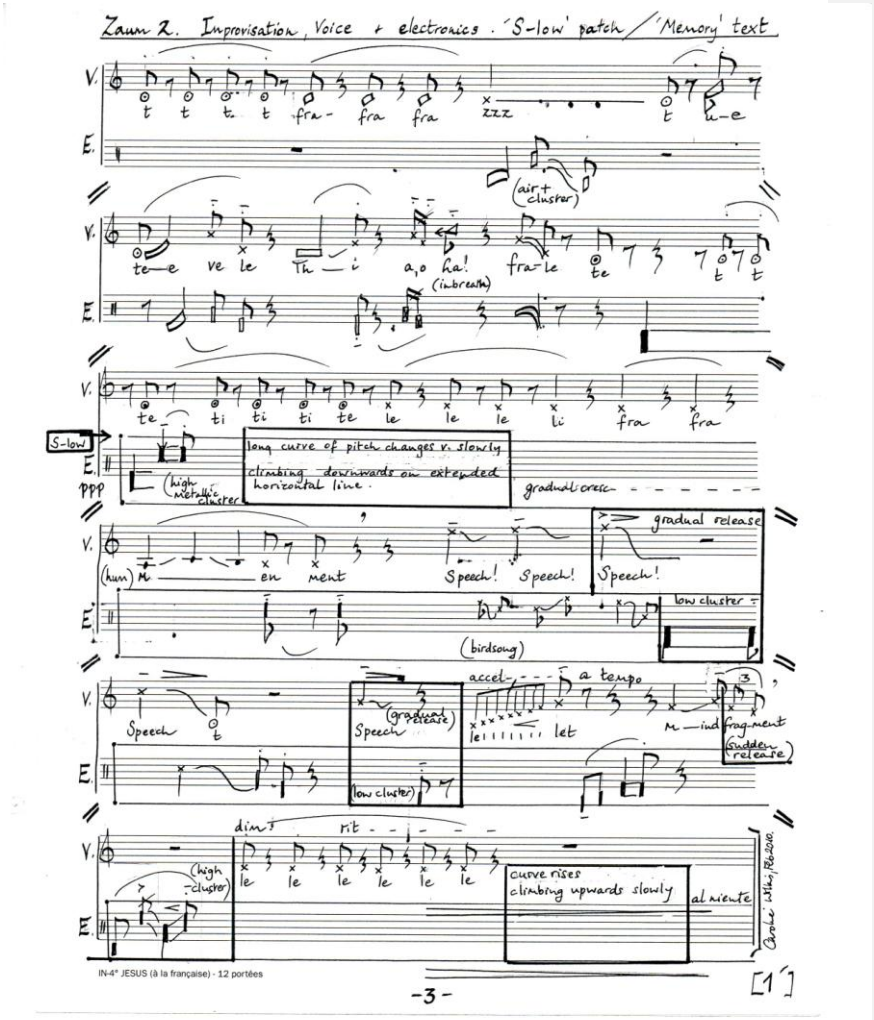



Figure 2.3: Analysis of voice and electronics, *Zaum: Beyond Mind*, C. Wilkins.

Early recordings of the spoken voice with some sibilant, breath, or fricative accentuation revealed that the electronics were following its melodic contours very closely. A slight emphasis on a word was marked by a percussive response and whispered consonants resulted in a distinctive echo with some pitch alteration. An

elaborate spoken melodic curve was expanded as a cluster describing rapid pitch contortions. Generally, consonants produced different degrees of percussive sound, their abrupt release causing a sudden escalated jump in the pitch range of the cluster due to the Pd *burst*, a section of the patch that controls the response to a slow or quick release of live sound. The reverse was also true, in that a gradual *diminuendo* for example, would cause the electronic cluster to drop in pitch. Exclaimed words were treated with a percussive, distorted echo of the original in vocal imitation. Any complex live sound, such as laughter, was often treated with a mixture of air, clusters and percussion, following the exact pitch curve.

Finally, with regard to the bandoneon and live electronics, the current responses have been developed to react with more independence and time delay. One addition is a friction-like sound based on a playing technique of *bellows-rub*. String-like, percussive punctuation comments on long, sustained bandoneon chords, whilst isolated pitches taken from them are reproduced as quasi-flageolets occurring later during the course of the music. The combination is effective, the electronics taking on the role of commentary, yet retaining a vital harmonic link with the live material. It is interesting to compare an early sketch for voice and acoustic bandoneon with a later counterpart, now replaced by the virtual instrument. Gestures of opening or closing the bellows are transformed into more subtle, complex electronic timbres that retain all of the body of the original sound as it closely follows the contours of the speech.

At this point it seems important to refer back to Bourdieu and his overriding concern with understanding embodied knowledge in the light of analysis (1977: 87-95), as mentioned in my introduction. Starting from the principle of improvisation within certain parameters meant that much of the live musical material was generated spontaneously and later transcribed on to score paper by means of a flexible notation method, for analysis. This approach differed wildly from that of my collaborator, whose analyses were linked to electronic responses read by the Pd patches. It led to the use of a new vocabulary taken from both music and technology in order to find a middle-ground of comprehension, although a rapid learning process with regard to tools and terminologies did take place. On-going analysis, in conjunction with experimentation, offers the possibility of dialogue between cognitive and unconscious knowledge. A vital link that I would argue for here is

gesture, whether visual or aural, on paper or in electronic sound, as a tool of communication that retains all of the body. Derived from the Latin *gerere*, meaning *to wield*, gesture expresses feeling through movement, through verbal rhetoric, through visual traces such as drawing or through a musical *figure* that contains a distinctive aural shape. Its definition implies a need to communicate that *meaning contained within*, operating, as it does, on the level of the signifier.

In this light, it is also vital to remember that one of the inherent characteristics of a piece that involves interactive electronics is its changeable nature; within certain parameters each performance of it undergoes a necessary, evolutionary process. Here the score is approached as a performance text for its author-performers, its re-creation depending entirely on the parameters of each performance, within which a unique moment of live interaction is followed by its evaporation. As Björn Heile indicates in his previously quoted essay on the subject (2006b), a shift towards a music theatre that critiques the tradition of a fixed score has important consequences on the discipline of music studies as a whole.

## 2. Methodology

### 2.1. The Relationship of the Spatial to the Temporal

In essence this important issue manifests itself clearly in two ways during the process work undertaken:

- in real-time performance
- in the combination of live music or sound and pre-recorded or live electronic sound.

The live presence of the instrument is enhanced by its amplification, for example of air, or percussive noise on the keys or bellows, producing a macrocosm of these otherwise relatively inaudible sounds. They claim another virtual, audible space, unlimited by a localization of their source. In the same way pre-recorded samples of bandoneon music can be relayed acoustically and modified or processed at will in order to change their identity. This frees the player from any direct link between the sound and movement he or she is producing, as in some instances it is not technically possible to play in the same way whilst moving. To paraphrase N.

Katherine Hayles (1999: 291), the human functionality of playing an instrument expands according to the parameters of this particular cognitive system belonging to sound technology, extending an embodied awareness on the part of the performer by means of electronic prosthesis. Such an approach sets off the live from the recorded, played back or manipulated sound in a strategy of immediacy, emphasizing their confrontation within the acoustic/visual space. Even more exciting is the use of live electronics in dialogue with the instrument, operating in real-time but obviously coming from another dimension within this space.

The same applies to the use of the voice as an extension of instrumental sound, employing a wide range of techniques including speech, pitched and non-pitched sounds, Sprechstimme, etc. It is relayed in real-time, by means of a wireless microphone, to any of the speakers. The effect of spatial difference, of far and near, macro-/microscopic, is created by a dialogue between the four sources. The listening space offers so many possibilities when diffused sound is integrated with live performance, such as ambient sound (coming from many different loudspeaker sources in the room), immersive sound (filling the acoustic space to the point of saturation), and spatial distribution (the effect of distance and proximity between live and diffused sound sources).

### 2.2. The Relationship of Performer to Public

This aspect ties in with my original question as to how a presentation context can be extended to suit the demands of a particular performance work. It is to do with the flexibility of a space, performers and public. In this case, the public will need to be situated within the performance area in order to hear diffused sound issuing from all four surround speakers and witness the close interaction between live and virtual elements. Within an ambient space, whether it is to do with sound or visual elements, it is absolutely vital to create this possibility, as the audience perception will shift constantly. The public is then engaged in creating their own personal version of the work according to where they sit. Proximity between performers and public allows for an engagement with the energy field set up by the former, this on an essentially dynamic level, allowing for a crossing between the borders of reality and fiction. In this work the vocalist moves through a gangway dividing the audience seated on floor cushions, addressing them with words and gestures,

confiding ‘secrets’, observing their faces and colours of their clothing or the ‘landscape’ that surrounds them, showering them with paper flowers. Sometimes she approaches individuals amongst the audience very closely, eliciting expressions of complicity or surprise on their faces. Working to some extent with the reactions that are provoked, her role approaches that of the clown playing with the audience. At the same time she communicates something of the fragility of her character in moments of confrontation with the subversive presence of a second performer and his powers over the virtual protagonists, in the form of ‘other voices’.

**2.3. The Relationship of Performer to Instrument(s)**

The intimate relation of performer to musical instrument is no more apparent than in the case of the bandoneon. Not only does the instrument ‘breathe’, it also moves like an elongated human lung in response to the player’s arm movements. At times I am aware of a reversal of roles between the organic and the object, as if the instrument is animated and I simply follow its direction, its gravitational force. Incidental sounds produced by this movement seem like commentaries, reminders of its inherent mechanism, of its ‘body’. I explore the instrument as a physical form in relation to my own body, discovering ways of playing it in all meanings of the term. There is a constant flux between my following its movements and the reverse, one body becoming an extension of the other. This relation of the animate to the inanimate takes as its source my profound interest in automata and their interaction with human beings.

To return to the voice, another instrument produced by breath, it seems like a natural consequence to enter into vocal dialogue with the bandoneon. Again I am interested in using unorthodox vocal techniques as a palette of timbres — for example, whistles, laughs, sighs, hisses, hums — some related closely to the instrument’s colours, extending its inherent air sound as it puffs, squeaks, coughs and moans. This can take place in a very subtle way, so that the audience is not aware of the exact sound source, or as a form of counterpoint, whereby both vocal and instrumental lines are clearly differentiated.

It is necessary to include the extended instruments in space in relation to the performer, in this case the electronic bandoneon and the electronic voice, virtual instruments that interact with the two live components in real time, virtual

extensions of the performer. The relation is once-removed, distanced, alienated by a process of modification of the original sound source. This dissimilarity allows for more play on the part of the live performer, freed from any constraints of direct imitation or variation and faced instead with a palette of possible responses, some of them unexpected. There is a close dialogue between the physical and the virtual bodies, that of the live voice/bandoneon and their electronic counterparts. In a sense the live body becomes animated by the virtual in a chain of overlapping sound stimuli, so that their borders cross in a constant flow of multiple layers. Action and perception are blended together in an embodied mediality. Here information technology is embraced without the element of disembodiment, finitude being acknowledged as a condition of the human being. Both human and machine are embedded in a material world of great complexity. Ultimately, what is constructed is one large *instrument*, a complexity of sound that evokes Helmut Lachenmann's statement regarding the act of composition as 'building an instrument' (1996: 79, 'Bauen eines Instruments').

Working with live electronics generated by a Pd programme raises the question of randomness and pattern in the light of a semiotics of virtuality. These two components that go to make up abstract information are interacting with the presence and absence of a material particularity embodied by the performer. The results are dependent on highly recursive processes, generating an open palette of contingency and unpredictability. There can be continuation, disruption, mutation or a state of hyper-reality produced by the effects of one set of components on the other. Hayles, writing of the abstract pattern, says it can 'never fully capture the embodied actuality unless it's as *prolix and noisy* as the body itself' [my italics] (1999: 22). Randomness is defined as the 'froth of noise' by Francisco Varela whilst Henri Atlan points to noise as 'the body's murmuring' (Varela, Atlan in Hayles 1999: 285). There is a degree of unpredictability in programming that becomes a creative ground from which patterns can emerge in unknown complexity, resembling in turn the perpetual processes of an organism. In an articulate, dynamic partnership, humans and machines are able to interact without the factor of domination or autonomous will that has so determined the history of creativity, and thus explore new configurations and ways of thinking with regard to the subject. What were previously internalised thought processes in music

composition become transformed into organised properties distributed across the media of technology in conjunction with the performer.

Given the non-traditional nature of my approach to musical performance, it is clear that I am deliberately entering into a place of experimentation in order to allow for unexpected collisions and combinations of sound and movement. This demands a certain kind of 'amnesia' on the part of the player as if he/she encounters an 'other' *instrument-body* for the first time. This would correspond to the actor's re-discovery of the character he/she plays at that moment of performance. I refer here to the work of Eugenio Barba and his *Odin Teatret*, mentioned in chapter 1, where the actors work on exercises separating movement sequences from words, and juxtaposing them at random so as to create new meanings. The traditional coupling of the two is replaced by a state of openness allowed by a process of 'letting go' of the outcome, of conscious memory, or of programming. What takes place then is a two-way exchange within the performer in a shifting, passive/active proximity. A musician's training often prevents such a move into the unknown for traditional aesthetic reasons, which, in turn, still determine contemporary instrumental technique. Perhaps this points to a need for re-examining our performance skills, as mentioned in my research question, where a use of relative knowledge can be re-balanced together with a tendency to over-specialize, thus developing a more open attitude towards new forms and contexts of performance.

### 2.4. The Relationship of Sound/Music to Visual Elements

> The eye takes the attention and dominates: The individual cannot decide whether they want to hear more or see more. When the audience's attention is so strongly absorbed that the music cannot be heard […] this becomes […] a problem that we should seriously consider.
>
> 'Das Auge bindet die Aufmerksamkeit und gängelt: Der Einzelne kann sich gar nicht entscheiden, ob er mehr hören oder mehr sehen möchte. Wenn die Aufmerksamkeit des Publikums so stark gebunden ist, dass eine Musik nicht gehört werden kann [...] dann stellt dies [...] ein Problem dar, das wir ernsthaft zu bedenken haben.'(Klaus Huber 2001: 393)

This statement by a contemporary composer of opera concerns aural and visual movements, either in dialogue or competition with one another, their presentation, and their emotional and imaginary sources. The diversity of their dimensions affects the consequent perceptual aesthetic that arises from this encounter. Audible movements have a certain impact when put into dialogue with those of the visual, whether gesture, dance, choreographed lighting or image, in what is essentially a dynamic interaction between these particular arts and their media. Embodiment and the physicality of music can be examined in their relation to *movement*, and both audible and visible movements can be analyzed for their interplay and exchange, this by taking the *performative* utterances of music as a central point of departure.

I illustrate quite simply how this relation can be de-connected and re-examined in the light of a new encounter between the two. If a musician sits or stands and performs on their instrument in a conventional way, with or without music-stand, the visual/aural connection made on the part of an audience is one of functionality, that is to say the movements and gestures serve to underline the mood of the music, whether contemporary or classical. As soon as they are asked to deliberately perform other functions not pertaining directly to the instrument, such as stamping a foot, singing, speaking, or changing places, we are already in another dimension that extends this relationship and acknowledges *another* body in space. That is to say, a little scene is taking place around the musician and we are already in the domain of a kind of choreographed performance. The meaning of the music has been slightly displaced to include that of other, visual elements that contain another independent or parallel meaning. A re-connection is happening in the audience's mind, searching for associations and following each element in turn in order to attempt some kind of cohesion.

In *Zaum: Beyond Mind* I deliberately begin with the creation of a scene, occupying and determining the space around myself and the *object-instrument.* The visual movement or gesture is not necessarily linked to a certain sound; both determine their own paths. Indeed, physical acoustic sound is sometimes absent altogether during these movements. It can take on a virtual presence through the medium of loudspeakers relaying pre-recorded material, or live electronics, or a magnified version of the live instrument through amplification. The former leads to a dislocation between what is seen and heard on the part of the audience, freeing the

player to explore another dimension, another reality. This raises the question 'Does a thing heard replace a thing seen*?'* [in English] (Goebbels 2009). What happens if we hear live music in darkness, as an acousmatic experience? Or indeed, if we split the identity between what is spoken and the speaker, so that the latter disappears? Goebbels argues that in so doing we not only save the spoken word by allowing it to develop as an autonomous audio element, but also gain an autonomous actor-body who is no longer doubling a role. The result is two bodies: 'the text as body and the body of the actor' (Goebbels 2002c: 70, 'den Text als Körper und den Körper des Schauspielers'). Heiner Müller, author and collaborator with Goebbels, strikes a remarkable parallel attitude with author and filmmaker Marguerite Duras in his approach to memory and the voice: 'a series of non-coalescent voices in quasi-human form, voices that float in the theatrical space we can never enter but see and hear' (Müller 1993: 18). Duras's voices are autonomous in the play that later became a film, *India Song* (1972): 'They speak amongst themselves, and do not know they are being heard' (1976: 145).

Another important element is the relation between tempi, those of the visual and aural components. One can accelerate, for example a spoken text, whilst the other, such as a sequence of images, decelerates. A fundamental issue is addressed here with regard to our psychological perception of multiple events happening on the stage at the same time: essentially it concerns the problematic situation or 'endless trouble' [in English] (Goebbels 2009) between one's own reaction as an audience and the action — in other words between the hearing and the seeing, whereby most of us miss a great deal and focus only on certain aspects. 'So finally in every performance each member of the audience has seen another performance' (Erika Fischer-Lichte 2003: 305, 'Insofern hat letzendlich in jeder Aufführung jeder Zuschauer eine andere Aufführung gesehen'). This statement on Cage's *Europeras*, referred to in the previous chapter, applies equally to contemporary forms of music theatre that have undergone a performative shift in their conception.

This leads me to the role of the imaginary sound-body in performance. Its appearance frees both music and speech from the confines of live aural/visual synchronization. The unseen voice or instrument become desiring bodies containing their character within their sound. There is a fundamental difference in perception between their physical absence/presence, one that highlights the dramatic

possibilities of independent aural and visual components at play. Live electronics enter with other *instruments in space*, those of virtual voices and instruments, whose sonic characters are marked by differences of timbre. The invisible sound-body enjoys an unlimited spatial diffusion within the performance area, whereas the live sound source remains localised. The virtual instruments react as a macrocosm to the localized, acoustic sounds of the live instrument or voice, introducing an unpredictable element of play into this dialogue between absence and presence. Likewise, any over-amplification of the live instrument magnifies its presence, making of it a virtual double whose sound we seem to be hearing from within. The eye and the ear are confounded by a disjunction between physical size and sound. Whilst the instrument is visually present, its localized sound has been replaced by another larger, imaginary sonic presence.

### 2.5. Objects – their Role, Placement in Space

In her reflection on the musicalization of all theatrical means, Eleni Varopoulou points to the use of objects on the stage which are played as musical instruments by means of their interaction with the human body (Varopoulou in Lehmann 2006: 91-93). There is a parallel to be drawn here with the sound theatre work of composer Carola Bauckholt, *hellhörig* (2008), where everyday objects are brought into a dialogue with voices and instruments in an exploration of timbre and nuance. With regard to *Zaum: Beyond Mind* this issue concerns the reverse — the placement of an instrument on a small table in such a way as it seems to resemble an object.

Figure 2.4: Stage-set of *Zaum: Beyond Mind*, Sussex University, May 2010. Image: A. Hafeetz.

Divorced from its functional context the instrument is free to become a visual object in the mind of the audience. Such an *object-instrument* carries with it a great deal of past history, which a present audience may be vaguely aware of, particularly once they hear its characteristic timbre. Placed within another context, however, it becomes a new object, shed of dismissive labels, and is allowed to 'speak' differently, to show us other aspects of its form. It is this possible, neutral quality of objects or musical instruments transposed intentionally into *another space* that has always fascinated me. There is a play of time that happens in the mind of the receptor, a re-connection between past and present. Visually the bandoneon reminds one of a box stood on its end, a child's jack-in-the-box perhaps, waiting to be opened. Once unfolded, it takes on various shapes and forms, reminding one in turn of monstrous reptiles or mystical symbols. The 'object' can be played to produce extraneous noises, whether it was designed for this purpose or not. The player elicits sounds that reveal its particular texture, materials, resonance — in short, *gives it a body*. Both musical and technological instruments claim their space in the stage-set and become *object-beings* with their own presences, set into animation by the performers.

**2. 6. An Aesthetic of Exteriorization**

Following a definition of the term in chapter 1, my concern with embodiment in music is reflected in a compositional aesthetic based on revealing the process of sound production. Working with the voice or with the bandoneon I concentrate on the mechanism that makes the sound, of rendering *it* audible, as if we, the listeners, were inside this *space of the instrument.* Thus it is exteriorized by means of vocal/ instrumental technique and electronic manipulation. The stage set, involving the computer operator as performer, the presence of technology and the wired instrument, is visible to the public. What they perceive is a complex 'machine' of action and sound. Not only are the 'workings' of our interaction visible and integrated into the dramaturgy of the piece, but the amplified sound issuing from all corners of the space seem to come from the depths of the instrument/voice, revealing an undisguised rawness. Timbres drawn from the sound production process of both voice and bandoneon, such as air or percussive sounds, are magnified and manipulated to take on an independent virtual existence outside of their original source. The *body* of their sound is turned 'inside-out' like the

equivalent of a *Moebius* strip whose exterior surface is in continuity with its internal one. In this respect my aesthetic has a clear link to Deleuze's theory of the 'fold' (2006), whereby a traditional relationship of subject and object with regard to the audience and the performance of a work, is refuted. In its place is offered the possibility of multiple perspectives that shift audience perception from a position of observation to one of encounter.

On concluding this chapter I would like to recapitulate on issues that have arisen and bring them into alignment with aspects of my thesis question. A key point in embodied research is the learning process involved in isolating, testing, and comparing experiments, whereby subjective experience comes into dialogue with self-observation. Allowing for the disposition of time to carefully collect data and change the artistic content of a work accordingly, means that its progression becomes embedded in knowledge. Terminologies are invented as tools, encouraging a meta-discourse between the practitioners. Improvisation and experimentation are necessary links to unconscious embodiment, the virtual entering as an extension of the physical and not as an alien sound source. Given the extent of embodied learning demanded from this particular project, it is not surprising that much creative work involving close interaction with media technology does not easily transfer, if at all, to other performers. This raises issues not only with regard to its life-span but also to its evolutionary process over time.

Turning from the world of digital to that of analogue sound technology, I will start my historical journey from the present to the past by examining the role of old and new media in discourse with each other. The next chapter concerns a work involving old methods of sound reproduction in conjunction with digital recordings. The question of embodiment in music will be examined from a slightly different perspective in these subsequent chapters, once-removed from my previous experiential role as both performer and composer. Instead it is based on collaboration with particular performers and the creation of a score that is designed to be interpreted by others.

# Chapter 3

# The Machine Era

## 1. *Phonurgia*

This chapter concerns a work entitled *Phonurgia* — music theatre for solo string player, gramophone & sound diffusion, with lighting & choreographed movement. The title takes its origin from *Phonurgia Nova* by Athanasius Kircher (1673), a manual on methods of sound amplification using horns of different kinds.

### 1.1. Old Media

*Phonurgia* is a work involving an essentially spatial distribution of various sound sources, whether diffused over loudspeakers, through a gramophone horn, or played on a live stringed instrument — in essence, a 'play' between live and virtual *musicks.* I use the term here to indicate the socio-historical role played by early sound reproducers such the gramophone, that came to replace live salon playing or *musicking,* as exemplified by the string player, but were still the focal point of social gatherings together with their predecessors, mechanical music machines. Indeed virtual *musicks* are present in *Phonurgia*, both in the form of shellac and digital recordings, the latter re-producing a recording made on the wax cylinder of a phonograph with all of its additional 'noise' retained. The only 'clean' virtual music to be heard is a digital recording played at the beginning of the work. In confronting vastly different playback methods with each other I am addressing contemporary expectations of sound quality, where increasing refinement and standardization assume an underlying aesthetic of transparency and clarity of the medium, whose process is no longer audible. Indeed, digital sound technology replaces the real in providing us with an utterly convincing virtual presence of music in space. However in this work I attempt to address what it is that has been refined and what we have perhaps ignored in the process. Early recordings reveal an undisguised rawness in their sound. It is exactly this immediacy, this undeniable imperfection of

a sound source that I wish to acknowledge — the 'body' or physicality of sound in space.

In this work the historical context of hearing a recorded sound is examined by relating it to the present time. This is achieved by a 'lifting out' or distancing of the material from its historical background, allowing for a freer sound association in the mind of the listener, in short, a 'play of time'. The 'voice' of a sound source is its contact with the listener. Early sound reproducers retain a very direct, unfiltered quality in the unevenness and awkwardness of their rhythms, tempos and tunings which alert the ear to their idiosyncrasies, whether due to mechanical imperfections in the machine or faulty grooves on the shellac disc. These fluctuations lend an immediate, unpredictable presence to the sound, installing a certain doubt as to its ability to continue. They are part of the sound product in allowing it to 'speak'. By acknowledging this message of the 'grain' as 'the materiality of the body' (Barthes 1984: 182) I re-affirm the importance of physicality as a mechanism within sound.

### 1.2. A Discourse between the Old and the New

Digital culture, in its concern with the ever-shifting relationship between the real and the virtual, has in many respects come to represent the ephemeral. No wonder, then, that much of its thematic material has in some way to do with the past and memory, reincorporating it into the present time. The materiality of the archive, such as the shellac disc played in *Phonurgia*, becomes an embodied moment that is, then, brought into play with another temporality, that of the live performer. This splitting of time recalls the 'crystal-image' of Deleuze, engendering an altered sense of duration in the mind of the audience: 'the crystal-image is as much a matter of sound as it is optical, and Felix Guattari was right to define the crystal of time as being a "ritornello"' (Deleuze 2005: 89). There is a link here between early 20$^{th}$ century technology, marking the beginnings of an epoch of simultaneity, and the digital, with regard to the manipulation of time. Henri Bergson compares the act of memory, shifting from the present to the past in order to delve into a particular moment, to the technological function of focussing a camera (Bergson 1911: 169-232). This analogy between a media tool and the human brain is revealing in its reversal of functionality; here a technological tool that has to do with images serves to explain part of the human body.

Furthermore the act of remembering can become a central theme of the performance as we witness the process of its staging. Listening to recordings becomes a performative act, as indicated near the beginning of *Phonurgia*, something experienced on multiple levels by both protagonist and audience. Whether it consists of hearing other interpretations of a work or recalling one's own documentation, as in *Krapp's Last Tape* (Beckett 1958), this seemingly passive moment has the potential to communicate a great deal more than live words or music within a theatrical context. It is a re-play captured in time that allows us to explore both the past and future in the present moment. Deleuze and Guattari's concept of the *rhizome* (2004: 3-28) helps us to understand this multiplicity with regard to perspective and the memory, acknowledging the influence of random, simultaneous processes that re-order time in digital media and thus call for a pluralistic reception.

*Phonurgia* is to do with the experience of time's spatiality. It remains outside of the confines of logical progression, insisting instead on extension, repetition, time-image and simultaneity between the old and the new. The audience is plunged into another temporality through encountering a performance that contains moments in time. Our personal experience of time, normally controlled by social circumstances, is focussed during a performance on our perception of the present. It is precisely the translation of what we see and hear in terms of memory and meaning that enables us to re-orient our own sensory perception. Thus the 'now' becomes an infinitely intense moment, a mass that comprises constant re-invention, allowing us to gaze inward in depth. It offers an interesting light on Mark Hansen's question: 'How can media art broker an opening of embodied experience to the sub-perceptual registration of intensive time?'(Hansen 2004: 235).

For me a theatre of sound should involve considerations of its presentation on both a visual and aural level. Here listening becomes an act perceived in relation to the other senses: 'acousmatic music' allows for an 'interplay between the intrinsic and extrinsic qualities of sound' something that 'aligns itself so well within a music theatrical context' (Nick Caswell 2010). It is precisely these extra-musical factors that shift the relationship between listener, material and author as the boundaries between conscious recognition of a sound and sensory encounter are blurred.

In this work the audience perceives the sonic and visual connections between the various sources differently, according to their position around the performance

space as freely moving spectators/listeners. Within a time-frame of thirty minutes we witness a performance by the musician/actor, who moves from one designated space to the next amongst the audience. The gramophone, placed on a small table, is heard in juxtaposition with sound diffusion from four large speakers placed around the room. The space is carefully lit and the sounds emerge from different acoustic spaces, creating an overall ambience in which the audience is immersed. Recorded material issuing from the music machine and speakers, such as the end- (or locked-) grooves of various 78rpm shellac discs, combine to form a dense web of poly-rhythms and textures, through which the stringed instrument, played by the performer, directs its more penetrating sound. The simple action of changing the direction of the horn is an important element in determining the distribution and timbre of live gramophone sound in space, particularly when mixed with the instrumental music. The quadraphonic diffusion apparent at the beginning of the work is changed to two different stereo recordings in the final scene, setting up a discourse between repetitive, machine-like rhythms of needle on shellac and a historical performance on wax cylinder. These are mixed to produce a large field of diffusion with the former and a more localised, distant volume level with the latter.

### 1.3. Enter the Instrument

The musician-actor is a protagonist who moves through the performance environment, operating the music machine and responding both vocally and instrumentally in turn. Old sound technology, no longer serving a purely traditional role, is put into play with the new, thus revealing its potential as a contemporary sound source. From the beginning duo between gramophone and viola the rhythmic rotations of the hissing locked groove come into play with the whispering high pitches of the latter, two sound textures that intertwine in their similarities.

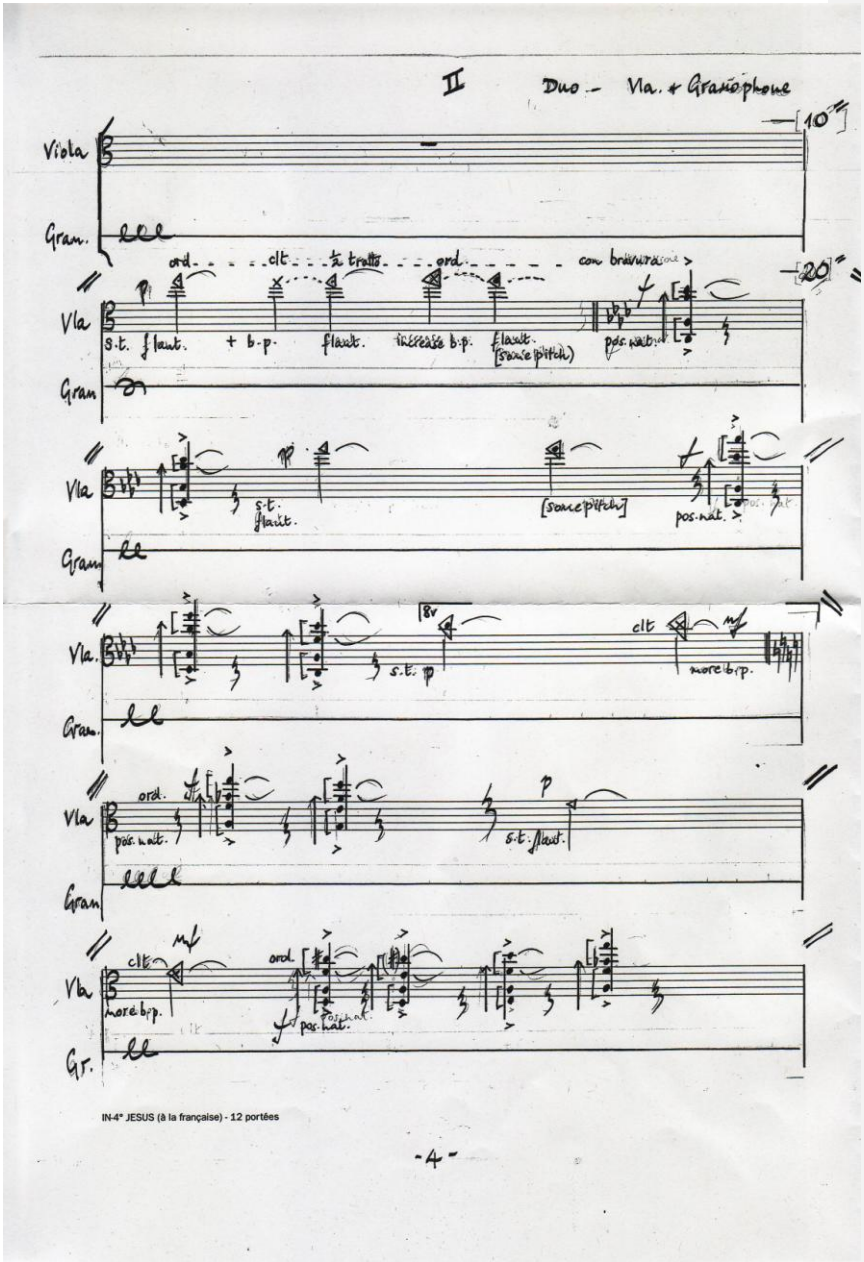



Figure 3.1: Opening of Scene II, *Phonurgia*, duo between gramophone & viola. C. Wilkins.

The music alternates between traditional string writing and unconventional sound production in what sometimes appear as fragmented, rhetorical gestures. Our ears shift continuously from the familiar to the unfamiliar terrain of sound perception.

This becomes all the more evident when the viola bow produces a large palette of sound colours from the object of the gramophone horn itself. An object designed for amplification becomes a musical instrument itself, a source of percussive, frictional and pitched timbres that sometimes sound together with that of the viola in one bow stroke. The motor mechanism is put into operation during the next scene, sounding similar to an old film projector as the turntable revolves freely. It produces a sonic landscape in which we hear fragments of whispered vocal utterances closely weaved into a viola part that alternates between quotes from classical sources, virtuosic display and vertical, percussive punctuation. We are in the world of associations belonging to the protagonist as he wanders through the space during what could be a rehearsal session.

By the fifth and final scene a transformation has taken place, whereby the viola begins to sound more and more like its mechanical counterpart. Surrounded by the dense texture and rhythms of multiple locked grooves and a distant recording of a wax cylinder playing string music, (both recordings diffused from different stereo sources in the space), the protagonist frenetically explores the extremes of his own virtuosity in terms of sound. Classical technique is extended into a sheer discovery of timbre that penetrates the wall of diffused sound and enters into another dimension of the ambient space. At that moment we become conscious of the intermedial role of the performer, appearing to be both live and inextricably connected to the virtual music that sounds continuously as he interrupts his own playing with moments of suspended stillness. Izabella Pluta, as mentioned in chapter 1, refers to this perceptual phenomenon as the 'mediaphoric body', a re-working of the semiological figure of the 'metaphoric body' (Pluta 2010: 192), which refers to both a living and media-related performance presence. In her essay she describes a scene from Robert LePage's *Anderson Project* (2005) where the actor is facing a large image of his face projected on to the rear of the stage (figure 1.3). There is a shift or disparity between the two perceptions from the point of view of the audience, between the unseen, live face and the digitally-altered image of this projected face. By way of analogy I would like to invite a comparison in terms of live and virtual sound during this previously-mentioned scene of *Phonurgia*, where the instrumentalist is also facing the rear wall of the stage towards which he projects his sound. His body outline, emphasized by the contours of his back, assumes the postures of playing although we no longer see the contact

of bow to string. This aural/visual dislocation allows us to shift our perception of the virtual music emanating from the depths of an old historical recording and issuing from speakers placed in the vicinity, connecting it in our minds to the live musician.

### 1.4. Performative Practice

In many ways the work is a play about the protagonist, whose interaction with objects, sound, music and instrument reflects their own history. What results from this exchange is an expression of embodied articulation, according to de Certeau's definition as mentioned in my introduction (de Certeau 1984: 148), and reflects the particular experience of the performer in question. Essentially, the work concerns the performative aspects of being a musician with highly-trained visual, aural and motor memories, with associative musical memories based on repertoire, with one's own voice/breath as a natural extension of the instrument, or with the situation of nervousness before playing to an audience and a sense of playfulness in exploring new sounds. What happens in the personal space of the practice room where performer and instrument enter into a dialogue through movement, whether walking, standing or sitting, combining all manner of uncoordinated language such as comments, unrelated thoughts, humming or singing? Pauliina Hulkko (2010) has examined this relationship between perception, speech and embodiment in her term *choreophony*, a practice of speaking out loud whilst moving in space. She addresses the gap between bodily experience and language that often exists with actors and musicians, insisting on this as a link to corporeal performance. This consideration of the physical actions involved in performing music plays a major role in *Phonurgia.*

I am interested in why a musician chooses a particular instrument to play and what associations are made with its repertoire. Surely there is an identification taking place within the realm of character, the viola, for example, resonating with a certain mood of introspection on the part of the performer with whom I collaborated on this piece. Phil Owen, violist, collaborated with me extensively on the performative development and staging of the work after I had drafted initial compositional sketches and ideas on the scenography. For him the instrument represents the alto voice, an androgynous voice; he has to 'lean into' it in order to

make it 'speak'. Sometimes he prefers to play as if it were a viola da gamba, holding it between the knees, a position that offers more relaxation for the arms when practising.

In essence, this work casts an anthropological glance at embodiment within the relationship of performer and instrument in space. Unlike much cultural anthropology that turns its regard to the 'other', I am interested here in re-examining inherent cultural traditions within Western classical music training that become very apparent when magnified on a stage. Much of Kagel's music theatre, such as *Exotica* (1972), was concerned with applying an anthropological gaze to the musical traditions of Germany and Latin-America, two cultures with which he was strongly familiar. Eugenio Barba (1995) in his theatre laboratory explored the field of pre-expressivity in his performers, stripping down the masks of appearance to a purely biological level. This allowed for a re-connection between the conscious and unconscious aspects of the body's habits and knowledge in relation to its environmental context. His term 'deep-dance' (1997), referred to in chapter 1, is relevant here in its application to all performers, including the protagonist of *Phonurgia*, whose scenic presence of body-mind can be determined by his movement in space.

A fundamental problem to be addressed in considering embodiment and music theatre practice is the transference of focus from one highly-trained skill to another less habitual one, and to date I have never encountered a rehearsal process that has not been confronted with this issue. Ultimately, live performance has to do with a body moving in space for whatever reason and the difficulty lies in exactly this transference of reason. Removing an instrument from a musician means inventing other motives for bodily expression, eye focus, vocal utterances, gesture and ways of walking for example. It is to do with creating a persona or extension of her/his character that carries through these tasks without self-consciousness. However, the difficulty often lies in tapping the source of unconscious spontaneity that lies at the root of all performers. I deliberately avoid the use of the term 'acting' here, as performance skills have little to do with a traditional training largely built on words and more to do with an integrated approach towards the performative arts.

Don Ihde (2002: 8) sums up the dilemma well by sketching the difference between the embodied *here-body* and the disembodied *image-body*. Western approaches tend towards descriptions following the latter in terms of a spectacle

seen from a distance, whereas the former entails imagining an experience directly. In either case the key issue concerns the position of the subject's body in relation to a narrated event. Many of the issues surrounding this split in experiential perception have been summed up by theatre practitioners such as Jacques Lecoq, whose mimo-dynamic method taught an understanding of and respect for the movements of the human body in space. Interestingly, talking of science instrumentation, Ihde says 'bodily perceptions can be embodied through instruments' (2002: xvi). By extension this would mean musical instruments as well as technological ones. Perhaps this is where research into the above-mentioned areas, such as *choreophony* (Hulkko 2010) or musical space, could be decisive in re-balancing the body's education.

## 2. Methodology

In this section I shall analyse certain aspects unique to the overall structure of the work, such as staging, sound, objects and movement, with regard to their role and application.

### 2.1. The Relationship of the Spatial to the Temporal

Essentially we are confronted here with a multiplicity of spaces and times: that of the recorded music diffused over an ambient space, the movements of the protagonist within the space, their close dialogue with a historical sound machine from another era, and the mapping of a certain narrative that has to do with shifts of position and speed in the scenario of the work. Opening with a recording of classical string music diffused on all four speakers throughout the space, we become aware of a silhouette upstage left, standing in front of the backdrop and lit from behind so as to cast a long shadow in front. There is a spatial distance between this figure and the objects placed centre stage. As the music begins to fade the protagonist walks slowly forward in a lit path towards centre stage. The implication here is of a character emerging from another 'time' and entering a re-created space. During a period of two to three minutes the music has immersed the audience in its slow, meditative tempo and provided a necessary transition of mood.

In the final scene two recordings are played simultaneously over the sound system, a pre-mix of multiple shellac discs played in their end grooves, and a digital recording of a wax cylinder playing string music. The former is heard downstage towards the front of the performance space, the latter, during a shorter period of time, upstage to the back, suggesting a spatial difference between their historical times. Joining the sonic ambience is the live viola that cuts through this dense texture of sound with frenetic, piercing high pitches and repetitive figures, adding a third time, that of the present, to this poly-temporal landscape. The performer's standing position in the space, namely upstage centre towards the rear of the performance area, is definitive, not only in its sonic confrontation with a historical counterpart on wax cylinder, but also in the effect of penetrating a sonic mass of sound issuing towards him from the other end of the space. The audience directly situated in this area will witness the spatiality of sound coming from speakers placed behind them and from a source further away in front of them depending on which way they face. Temporality, in the sense of the audience's perception of time, is deliberately disrupted by the collision of different speeds, textures and rhythms, all at variance according to where they choose to stand in the space.

The movements of the actor-musician are a key factor in communicating a spatio-temporal experience to the spectators and listeners. Moments of choreographed sudden stillness are inserted into the instrumental passages during the final scene, for example, emphasizing the frozen time and space of the instrumentalist surrounded by a density of sonic activity. Another moment of stillness, this time meditative, occurs in the first scene whilst listening to the gramophone disc. The proximity of a listener sitting or standing near to the horn suggests a spatial intimacy suspended in time, as we watch and hear the shellac recording. In particular the fourth movement exemplifies the performer's inner narrative as he shifts from space to space, alternately playing and speaking during the constant whirring of the gramophone motor, dividing the space into a series of fast-changing scenarios as he abruptly changes tempo and mood. Repetition, rhythm and extreme tempos (acceleration/retardation) shift the time-space relationship, 'taking aback and widening the perception' of the audience (Hage in Roesner 2008: 19).

### 2.2. The Relationship of Performer to Public

The immediate question that arises here is whether this scenario actually concerns a performer who is about to play in public and is preparing for the event; in which case the audience is exposed to an internal world, that of the performative situation. They are on the other side of the dividing mirror, observing/listening from behind. On the other hand, they are not witness to an entirely solitary, introverted act, as the Prelude would indeed suggest. Here the protagonist's voice is heard whispering hoarsely though a gramophone horn protruding from the edge of the stage wing. He is already calling to our auditory sense in this voice-off even before he enters. We are beckoned to enter this other world of the performer and share his personal narrative. Encouraged to move around the performance area, the public shares a proximity of space with the musician-actor engaged in exploring both his real and imaginary worlds. A multitude of perspectives is opened up as we sense the nearness of objects, sound sources and embodied interaction on the part of the performer. In turn this encounter allows for a haptic experience of embodiment on our part.

### 2.3. The Relationship of Performer to Instrument(s)

Such a relationship involves so much in the way of extension that it is difficult to determine its particular dynamic. One should rather speak of performer-instrument. To begin with the two are deliberately separated in the work. *Performer observes instrument* should be my stage indication in the first scene perhaps, the viola lying on a table next to the gramophone whilst he listens to a virtual string player re-created by the shellac disc recording. A triangular relationship between them becomes clear, the aura and 'perfection' of an old interpretation challenging the potential of a real instrument and instrumentalist to combine in a convincing manner. Coming together in the second scene to play, as the end-groove of the disc announces the disappearance of a virtual musician and its continued technological presence, the performer-instrument explores a repertoire of timbres and sounds before shifting into more traditional *bravura* string passages of double-stopped chords. The quasi-improvisatorial nature of some of this material is deliberate on my part in order to generate a seemingly spontaneous dialogue between the two. This dialogue concerns an exploration of the animate and inanimate within the

relationship, where borderlines between cause and effect overlap. A third instrument enters the scene later on, elicited by the violist bowing the edge of the gramophone horn, sometimes in conjunction with the strings of the viola.

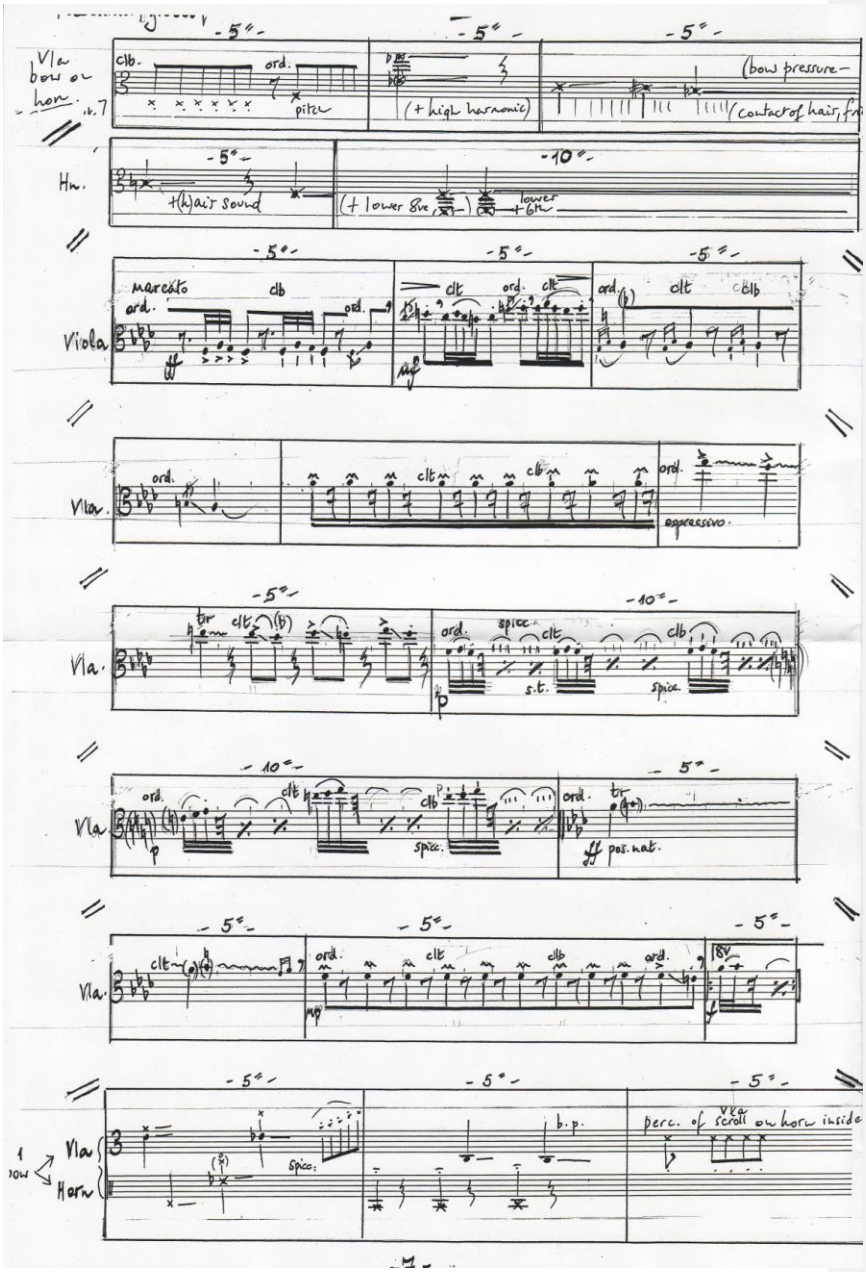



Figure 3.2: Opening of Scene III, *Phonurgia*, bow on gramophone horn. C. Wilkins.

The amplifier becomes an instrument, produces pitches, timbres and occasional harmonics together with the viola through a close interaction between the two sound sources. The voice also develops its natural affiliation with the stringed instrument. String players all share the share phenomena, to a lesser or greater degree, of singing, humming and breathing audibly when they play. Nicholas Cook refers to this auditory imagination in the performing musician as a kind of 'inner singing' or 'internalisation of performance actions' (Cook in Verstraete 2009: 193). I deliberately externalise these elements in *Phonurgia* in order to lay bare the performative aspects of making music. The relationship of performer to instrument being an essentially movement-based occurrence, I also examine the role of interruption within the flow of play. Deliberately inserted as increasingly longer passages of suspended play in the final scene, the musician literally stops in mid-flight as though seized in tableau form by a series of camera shots. These moments of intensity allow us to re-focus on the visual entity of performer-instrument and re-hear in our minds what has just passed before us in time. The memory doubles-back in that brief cameo moment provided by stillness.

**2.4. The Relationship of Sound/Music to Visual Elements**

There is a sense of play between sonic and visual elements in the piece, juxtaposing both live and recorded sound with the (in-) visibility of their sources. Opening with a spotlight directed on to the bell of a horn protruding from the wings — ('trumpet, megaphone, gramophone?' the audience ponders) — a whispered, hoarse voice issues from this most simple of amplifiers, referring in turn to the origins of the work's title. Verstraete reminds us of Michel Chion's term *acousmêtre*, meaning the master-being behind the sound, the supposed voice without a body, 'the "other," […] a gaze on our shoulders' (Verstraete 2009: 120). In fact this voice has its own 'body,' separated from the confines of representation in the human form, obliging us to concentrate on its intonation and timbre as much as on what might actually be articulated in terms of verbal meaning. Recorded viola music, diffused from all four speakers, follows the localized acoustic utterances of a voice from the back of the performance space. A visual link is made to the instrument and bow already lying on the table centre-stage and the waiting gramophone. Again our expectations are confounded when the protagonist turns to the machine and not the instrument. The

former's functional presence is put into action through the playback of a shellac disc. Our imagination is triggered to register and identify both music and instrument on the old 78 rpm record, being at the same time confronted with a vastly different aesthetic of sound perception in comparison with the first recording, this made all the more palpable by the live nature of the sound reproducer. This difference in sound quality is coupled with one of performance style, techniques with regard to tone, vibrato and phrasing having altered considerably over the last century. Initially however, musicians were influenced by one very important factor — the medium itself of the gramophone. Being denied any visual presence in the final outcome, they concentrated all efforts on gestural exaggeration during the recording process. We hear and watch the working sound of the mechanism issuing forth an intimate, spontaneous music stamped with its own obligatory single-take, and therefore unrepeatable (in the sense of unedited) utterance by the musician. The live musician remains silent, listening to his virtual counterpart.

Later when he takes up bow and instrument we wait in anticipation for the first sound, aware however, that the needle on the disc is continuing its movement on the end groove in a rhythmic loop. The gestures of the player and his constant shifts of mood are readable, indicating that much more is at stake than a classical interpretation of a score. Searching, exploratory timbres, reflected by their introspective movements, are contrasted strongly with *bravura*-like strokes of the bow cutting through the insistent rhythmic patterns of frictional sound supplied by needle on shellac. We are confronted here with a collision of different sounds from contrasting eras, that of the contemporary player and the Romantic virtuoso, evoking 'bodies in memory' (Verstraete 2009: 118) on the part of the listener.

Visually striking in presence, the gramophone horn undergoes a functional shift as sound producer when the bow lands on its edge. No longer seen and heard in its traditional role, the amplifier *amplifies* itself in a series of high pitched sounds, low chords and harmonics, sometimes sharing the same bow as the viola strings. The mechanical, grotesque nature of this scene is exemplified by the movements of the musician. Tense, almost machine-like, he reminds us of the main protagonist bowing/sawing the head in *Décapitation* from the surreal poem *Pierrot Lunaire: Rondels Bergamasques* (1884) by Albert Giraud. The invisible text at the beginning of the work, heard at first as a voice-off, is alluded to during the fourth scene, where fragments of words, in the form of phonemes, are sounded by the performer as he

mutters, sings, or sighs, alternating with, and sometimes extending, a similar timbre on the viola. A connection is made between the formerly heard text-body and its distribution within the sonic space by an actor-body. As he moves and traces a path around the performance area, we perceive a visual connection with the internal labyrinth of the memory, by turn searching and being reminded of words and music. He recedes to centre upstage for the final scene, positioned in front of a music stand and facing the imaginary audience beyond the back wall, suggesting a more integral role with the diffused sound of an ancient recording. The performance area is lit only with one spotlight on the performer's back, the audience standing in total darkness. This visual deprivation, occurring also at the opening of the work, increases the listener's auditory perception, imagination, and haptic sense of space within a sonorous envelope of diffused and live sound. It corresponds to LaBelle's description of the permeation of sound throughout a space, as being '*always* [author's italics] in more than one place' (LaBelle 2008: x), referred to in chapter 1.

In fact the timbres of crackling shellac discs that go to make up some of the pre-recorded material take on the qualities of an 'audio-phonic skin' (Connor in Verstraete 2009: 47) that touch, and are touched by, the listener's body. We become aware of the effect of sound, as a series of variations in air pressure, on the whole body. This phenomenon, described by Merleau-Ponty as 'chiasm' (2004: 247-271), refers to the experience of reciprocity between the act of perceiving and the thing perceived. Embodied listening, then, has to do with the awareness of sound's presence and locomotion in space, together with our own imaginary production of space in which we create a sense of unity for ourselves.

Viewed in perspective, the silhouette figure, standing upstage with his back to the audience, momentarily holds his playing positions and his music in suspense, washed by a flood of multiple sonic textures filling the space. In contrast to the recording of his historical counterpart, emanating from speakers placed to his left and right, the instrumentalist's live acoustic sound is directed to the back wall, resulting in a curious distancing effect that confounds our perception of the sonic source. Both his standing position and moments of stillness allow us not only to focus on his visual presence, but to de-synchronize our association between his movements and the resultant sound, as the virtual string player extends our aural imagination of that music. Instead we gaze on the sculptural aspect of the

performer-instrument freed from his task of continuity and standing in temporal distance to the prevailing musical narrative.

### 2.5. Objects – their Role, Placement in Space

The physical presence of the gramophone and its components suggests a *theatre of objects* that invites re-examination on a more abstract, visual level, and leaves to one side their purely functional purpose. We are confronted with a music machine that is put into motion, becomes animate, and the human presence of a protagonist who may not always appear so. I would argue for a sound theatre of objects that affords a new context and meaning to bodies, instruments and technology in space. Depending on lighting, loudspeakers can become object-beings, attendant music stands can suggest geographical sites of specific musical action, a lit gramophone horn next to a stringed instrument lying on its back suggest shapes and presences that are detached from their functional roles and invite contemplation.

The latent theatricality of musical instruments is something many composers in the past have hinted at. György Kurtág indicated, in his *Kafka Fragments* (1985-6), the positioning of two violins, each sitting in a chair waiting to be held, on either side of the musician. A mini-drama is created by the setting, inviting another perspective on the instrument-objects placed on the stage (Katschthaler 2010). In the same way that Goebbels argues for a separation between actor and text I would apply his methodology to musician and music. Here we can argue for at least three bodies, those of the performer, instrument and music. Included would also be the body of the object-loudspeaker directing its regard at the audience. This technique of displacement when we separate objects as entities in space allows for a re-examination of their 'being'. Thus, within the music theatre things can become exhibited in their being as objects, the space becoming a place of traces that are all related, in *Phonurgia*, to the performative history of the protagonist.

### 2.6. An Aesthetic of Exteriorization

I would argue here for the re-appraisal of media as audio-visual structures that offer us the chance to break their transparency illusion. My deliberate use of old media in combination with the new addresses exactly this issue. Exposing the inner mechanism of a sound reproduction machine to our ears and eyes means re-

evaluating what was judged as an obsolescent function. Playing a digital recording of these same mechanisms then confronts us with the old heard through the new, inviting us to shift and compare out listening perspectives: to hear both the 'inside' and the 'outside' of sounds in a relation of flux with each other.

Exteriorization can also be interpreted in a broader sense of the term to indicate the material embodiment of a performance. There is the cultural memory left afterwards, often relayed back to the creators, and the material traces such as documentation, notes and sketches that in turn affect the later work to come by becoming integrated into the performance score. Each of the works devised in my research was accompanied by a parallel text that documented its process and evolution alongside the actual score. This is what is meant by my reference, in the introductory chapter, to a 'critique génétique' (Genette 1988) that surrounds a work and provides an invaluable source for later consultation.

My argument is for the integration of both compositional and performative content in the score of *Phonurgia*, in a process of continually 'folding' the inner material with the outer. Elements of personal contribution in the form of improvisation or anecdotes from the performer go to make up the event, opening it up in the same way that he would base some decisions regarding order and content on personal choice and performance history. The presence of the actor-musician plays with the material of the text-score, making of it a live structure. The musical score includes not only notation for the stringed instrument but also for objects such as the bowed gramophone horn or the revolving shellac disc, sonorous qualities that have to do with audio or sound theatre. It is an inter-disciplinary performance text for a musician to enter into, allowing for changes within the content without losing either its intention or its artistic integrity. As such it is based on the experience of multiplicity involved in the act of performance.

The body of a score, as in *Phonurgia,* consists of multiple notational forms — music, text, illustrations or recordings — that are read in terms of their dynamic-spatial relationship to each other.

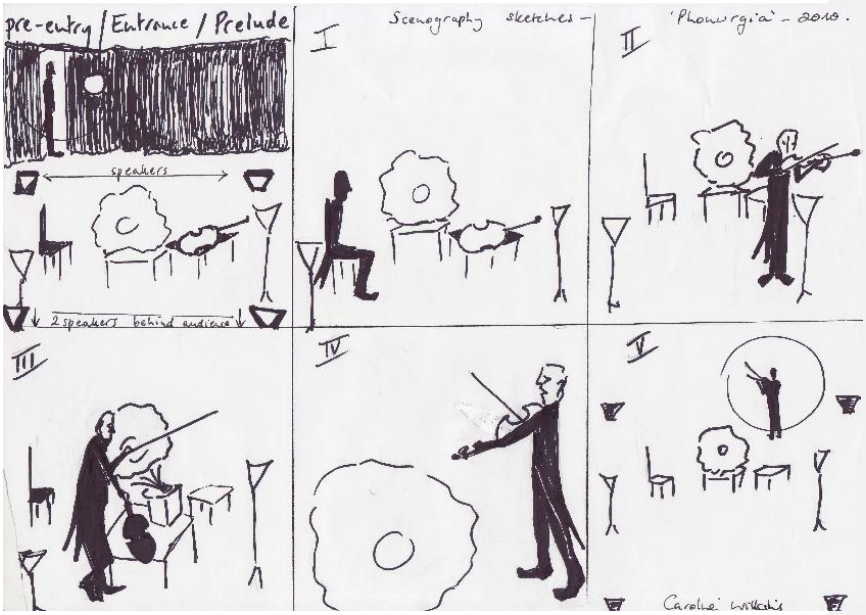



Figure 3.3: Scenography sketches, *Phonurgia,* C. Wilkins.

Thus I argue for a valid re-consideration of score-scripts in order to describe 'what bodies do on stage and what their positions and actions could signify' (Heile 2006b: 77). Perhaps it is here, within the score, that a potential meta-discourse between music and theatre can be set up, according to Till's analysis of their relationship (2003). At all events, their inter-communication is vital for a dramaturgical understanding of a work, where several elements are operating at the same time both within the score and eventually onstage. Thus it is transformed each time into an event authorized by all involved — performers, audience, creators and production team.

Ultimately written for any string player, my intention is that the musician brings their own personal performance history to the interpretation of *Phonurgia* and thus re-creates it for themselves, making choices of recorded music and spoken text that come into a reflective discourse with the pre-composed material. This form of personal engagement with the material communicates itself to an audience through its authenticity and singularity, resonating in turn with other memories and associations. Happily the first performance of the work was listed as an *event*, which ties in very well with the nature of its conception as a performative act that takes place within the close proximity of a public (Duncan 2004). The protagonist

senses the presence of other bodies in the stage environment — those of the audience. The field energy of the event is shared intimately with its receptors as they encounter objects, light, sound, instruments and a protagonist moving amongst them. According to Kattenbelt (2010: 29-37) this form of presentation, surrounding us with its materiality, its expressivity, intensifies our aesthetic sense by calling on our own embodied experience.

From the machine era I turn, in my next chapter, to an older version of musical data in tracing historical links between technology and the body. Piano rolls pre-dated the gramophone by a number of years, introducing reproductions of music played by pianists and composers to the domestic home. *Musicking* became extended to the role of a physical engagement with the pedals and levers on a pianola in order to control nuances of expression. Traces of these graphic data become the basis for a work that involves their presence in a displaced role as visual objects. Like *Phonurgia* this next work invites the audience to be part of its environment; however the installation of objects, light and video projection, together with the interaction of audience and performers, play a more important part.

# Chapter 4

# An Installation Environment

## 1. *PPPPPP*

### 1.1. Introduction

This work is an extension of an earlier piece written for player piano and piano player, magnified both in terms of instrumental resources and a staging that involves lighting, objects, video & choreography. I explore the spatial arrangement of six keyboards and their players placed in a ring formation, around which the audience can move freely. The name of this ensemble, *Piano Circus*, conjures up the world of colourful entertainment and humour, a travelling show. For this reason, in performance I would choose to costume the players in gaudy, tatty tailcoats, suggesting a reference to the diverse social history of pianists from the past that includes the worlds of silent film, cabaret and vaudeville, extending to piano bars, shopping arcades, club-nights and night clubs. Visually, tails are very effective when viewed from the back whilst sitting, which, in the habitual formation of this ensemble, will be the case. Their association with the tradition of concert hall practice of the last two centuries is turned to irony in a new context of contemporary music theatre. Interesting in this respect is a commentary made by Nicholas Cook (1998: 265) on musicians' dress as a way of emphasizing their intermediary role, namely as 'invisible servants', thus enforcing their social separation from the audience in a purpose-built auditorium, the subject of which brings me to my next concern — the performance environment.

### 1.1. A Concert Installation

As described in my opening to chapter 1, the possibilities of adapting a performance space to a continuation of occupied audience space offers a completely different context for the work and its encounter by a public. Most importantly it is an open inclusion of the audience in the energy field of the performance, an invitation to

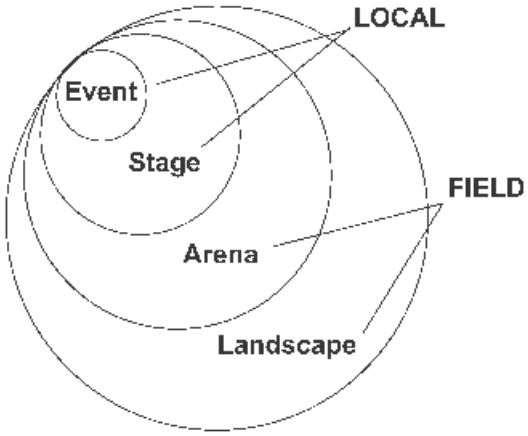
**Comment [c2]:** replace 'one'

place themselves as 'bodies' in the space of the event. Before the arrival of the performers an audience will move around a concert installation and examine objects, guided by their ears and eyes within a process of aural and visual logic that has been carefully considered by its creators as *composed* space. Later the music, sound, light, and movement of the musicians through the pre-existing presence of the audience contribute towards a haptic, spatial experience on the part of both. According to theorist Pieter Verstraete (2009: 218) the word ambience, denoting atmosphere and often applied to sound, has particular relevance in this context; *ambire* (L.) means to circumvent, to move around, which is precisely the intention of a concert installation.

This studio production of *PPPPPP* takes place in the black box of the Drama Studio at Brunel's School of Arts, an ideal space for many reasons. The overhead lighting grid accommodates the installation of six piano rolls attached by means of invisible thread, as well as desired lighting, such as backlight projection, direct focus spotlights on the centre stage and diffused Fresnel spotlights on the arena space. A video projector is installed and the larger loudspeakers blend well into the black corners of the space in contrast to their smaller monitor counterparts, which stand next to each keyboard and become part of the installation. No visual or aural clutter in the black box means that it can offer a focus on this 'theatre of objects' that are placed intentionally in different spaces and construct a framework of performance. Lighting plays an essential role in determining not only the perception of objects and performers in space, but also that of sound in space, by offering a counterbalance of light and shadow and focussing on specific areas, thus directing our visual attention and allowing our ears to determine sonic locality.

### 1.3. A Scenography of Sound

The six keyboards are grouped in a circle, the players facing each other. Stereo monitor speakers are placed next to each instrument and four larger speakers in the extreme corners of the room to provide surround sound in the landscape space around the performers. The audience moves freely around the arena space, seeing and hearing the performance from any vantage point.




I

Figure 4.1: Diagram of sound spaces, S. Emmerson, *Living Electronic Music*, p. 98.

I divide the circular theatre space into four areas according to Emmerson (2007: 98) — *landscape* (the peripheral space), *arena* (the space around the performance), *stage space* (the immediate space around the performers), and *event* (the actual space of the performer). They represent two frames — the *field* (landscape, arena) and the *local* (stage, event). Thus the monitor speakers are placed in the stage space and the larger ones in the periphery of the landscape. The monitors provide a *local* control of the sound issuing from each electronic keyboard on the part of each player, the larger speakers providing a mixed diffusion of the combined sound to the *field*. An interaction of frames, a frame-play, happens in the space of the *arena*, which becomes the fluid borderline between the two. The audience are in a situation of being able to move around the *arena* between the twelve monitors and four larger speakers, thus engendering their own sonic perspective of the work.

### 1.4. A Scenography of Light

An important element in this work is the use of three different kinds of light projection: still lights in the form of spotlights on centre-stage and arena, light patterns projected through the texture of the hung paper rolls, and moving light on the front surface of the paper in the form of a video projection. Six perforated piano rolls are suspended from the overhead grid and lit from behind so as to illuminate

their graphic patterns. Points of light describe a myriad of shapes through the translucent paper, a visual music that suggests its own structure in the form of aggregates, repetition, cascades and horizontal blocks.

Figure 4.2: Surface of original piano roll paper showing perforated patterns. C. Wilkins.

I would like to draw a parallel at this point by harking back in time to an interesting development in the Italian Futurist New Theatre of 1920. An *Electric-Vibrating-Luminous Theatre* used myriads of electric lamps of every colour and tonality on the black backcloth which was named 'sensitive darkness' (Kirby 1986: 222-296). Almost entirely replacing the presence of actors on the stage, these lights took on a quasi-narrative, dramatic quality in their movements, rhythms and intensities. A number of years previous to this innovation saw Alexander von Salzman and his technique of lighting developed in Hellerau during production work with scenographer Adolphe Appia (von Salzman 1913). Like the Futurist's invention, countless bulbs and spotlights were used, this time on both ceiling and walls, but concealed behind translucent white canvases, providing an indirect light

that could be projected over large surfaces and steered gradually in its variation and intensity during a long period of time. Salzman's concern with light as an enormous *body* that could become a co-player in the dramaturgy of the work by means of its expressivity, suggests an essentially corporeal approach to media and theatre that pre-dates contemporary thought.

Although my use of lighting in *PPPPPP* does not involve a digitalized contemporary equivalent to Salzman's, it is nevertheless interesting to trace historical technologies such as these and note their importance in determining our present aesthetic and structural concerns. Light, then, in the context of this work, becomes in a sense a 'performer,' changing our image of a space by encountering objects such as suspended paper rolls, through the perforations of which it 'writes' its '*Sceno-Graphy* ' (Wiens 2010: 30). It also awakens the haptic sense in the body by emphasizing the different texture of the paper viewed from either side. Composer Marko Ciciliani, previously mentioned in my first chapter, has explored this aspect of both sound and light textures in works such as *Corrosion* (2009) for analogue electronics and laser reflections.

Moving light makes its appearance towards the end of the piece in the form of a video film (taken from a previous rehearsal) that is projected on to the front of the suspended note rolls. It takes on an abstract, grainy quality due both to their texture and to the perforations on the surface of the paper. The length of each roll suggests an image of translucent windows through which we witness two very different plays of light according to its direction: the one from behind emphasizing pointillist patterns, the other from in front revealing the surface quality of the paper and disappearing into the blackness of its punctuations. Digital images of hands and keyboards simulate the reality we have just witnessed, but with a radical change of visual perspective as the keyboards are now vertical and the focus shifts rapidly from zoomed to panning shots. Video artist Olalla Lemus proposed these changes to the original images with a view to the configuration of size between the length of a keyboard image turned on its side and the long roll of paper on to which the film would be projected. Coming from a background of visual arts she was able to bring a fresh approach to the rehearsal/production sessions and editing process that remained parallel to the music. In her short film we are offered a kaleidoscope of 'stills' interspersed with movement that extend our perception of the spatial relationship between bodies and instruments. At the same time she has captured and

extended something of the essentially playful, circus-like nature that lies at the heart of the piece.

### 1.5. Machine-Object

The perforated note rolls serve as an archival reminder of the original format that was made for a player piano, the other part being for a live pianist. Although a present-day audience will not have known this earlier version, some of the piano writing in *PPPPPP* reflects most definitely a machine-like, as opposed to a human, virtuosity that is typical of the player piano. As in live adaptations of Conlon Nancarrow's studies for player piano (familiar to members of *Piano Circus*), the acrobatics of the mechanical piano are adapted to, and shared between, several pianists. Some examples in case would be chromatic glissandi, impossible to execute on the part of a live pianist unless one hand is employed for the lower white notes and the other for the upper black notes simultaneously. Fast, continuous note repetition has to be shared between the pianists, as with large chords spread across the entire keyboard. Rhythmically complicated passages are divided between them in order to separate and better articulate each line. Another typical characteristic of the machine-driven instrument, much exploited by Nancarrow, is rapid vertical aggregates of sound that combine to form enormous chord clusters. Highly dramatic in their quasi-orchestral effect, these are only achieved manually by careful re-scoring in order not to lose something of their dynamic quality. Thus the six pianists are faced with the task of embodying a music that has been written partly for a machine, adapting their movement and gesture to an unconventional piano writing that makes high demands on both technique and a sense of timing. A score which had been formerly inscribed on perforated note roll paper, relentlessly driving its way through a pneumatic piano action, is transformed into a living, breathing incorporation of human possibilities that include nuances of tempo, phrasing, dynamic and articulation by the performers.

Suspended freely from long threads and wafting slowly in reaction to small air currents, these material musical data, or technological remnants from the past, are all the more remarkable when juxtaposed with six keyboards whose mechanistic 'innards' are no longer there, replaced instead by electronic hardware. In between the two are the pianists, mediators between past and present in their embodied

knowledge of what has evolved before the arrival of their digital instruments. Previously serving as an interface between machine and instrument, as the 'workings of mediation' (Boenisch 2005: 115), these lengths of 'defunct' paper are deliberately exposed on my part. I draw attention to their 'other' presence as objects in themselves, to be looked at anew, examined by a curious public, something that was never possible in their former function when they disappeared into the drawer below the keyboard of the mechanical piano before being activated. What takes place in this moment of encounter has parallels with an archaeological re-discovery of exhibited traces, a dislocation of meaning between the signifier and the signified.

Instead of offering a synchronization between sound and image, (as often occurred with simultaneous video projections of Nancarrow's piano rolls during performances of his music), I explore here a play of time between the historical media archive and the present. Never intended as 'eye music,' in the sense of a composed graphic score, their machine-made perforations, formerly inscribed through the recorded interaction of technology with a pianist's body, hold a certain fascination for me. Replacing a musician by a composer perforating holes, this time by means of a manual machine, radically changes the perspective however. The paper becomes quite literally a score, whose patterns one hears inwardly during the working process. Having produced a note roll by this method, I became not only aware of this visual/aural experience, but also of the relation of physical space to temporal duration in the sheer materiality of shifting, measuring and composing on to reams of paper.

### 1.6. Object-Bodies

At the beginning of the piece, six *performer-bodies* enter, engrossed in a particular task that has nothing to do with their function as musicians. They are *actor-bodies* moving objects, encountering a public whose space they enter and with whom they communicate verbally or through gesture. Centre-stage sees the instrument-bodies, stools, a perforated 'curtain' of paper lengths, and attendant monitor speaker-bodies waiting, all half-lit, in expectation. (There is a magical, ghostly quality to a lit, vacant piano stool placed deliberately where no pianist is in sight; for this reason it should always be remembered before a mechanical or computer-driven piano). I argue for the existence of *object-bodies* in this performance, such as the score-parts,

the instruments, stools and the loudspeakers. Through pointing to their scenographic potential, this by means of placement, lighting and choreographed movement of the performers, I emphasize the gaps of meaning that are opened up by viewing these objects as something other than purely functional.

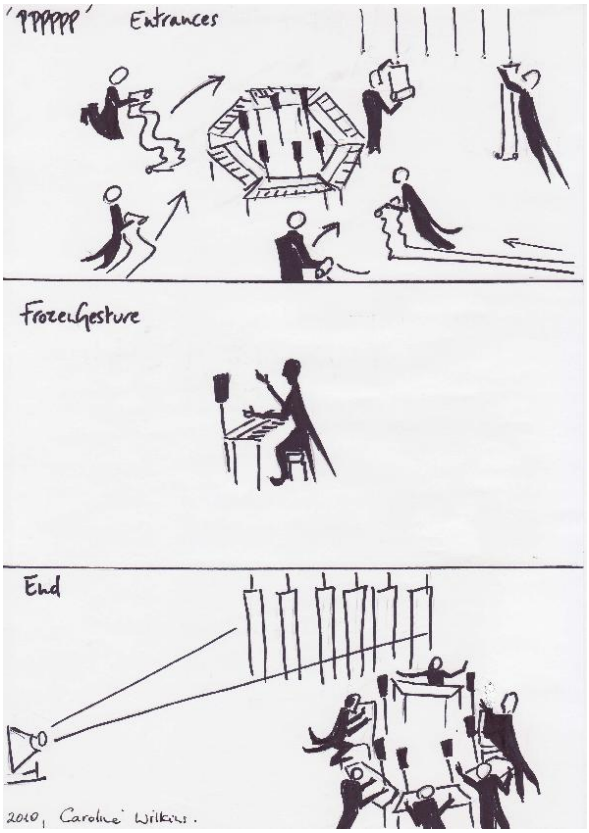



Figure 4.3: Scenography sketch for *PPPPPP*, C. Wilkins.

Although all of the music is played live, there are moments when each pianist suspends a movement in mid-air whilst the other music continues around them. We are jolted into a momentary dislocation between sound and sight, sharpening our visual perception of the performer-body in relation to the keyboard instrument, in an intense vertical moment of suspended energy.

At the risk of finding myself on slippery ground because of a shift in media, I would like to propose a comparison of this moment with the filmic 'still' image. Both Cook (1998: 84) and Barthes (1984: 67-68) refer to a 'third meaning' that

takes place when we 'read' this accentuated fragment from the inside, as a quotation, a trace, containing its own narrative. Particularly interesting in this regard is its relation to music, which, like film, takes place in time. The still image, like the still performer, suddenly steps outside of logical time and shifts our mode of reception from the narrative to another inexplicable opening-up of the seam. Both live and video 'stills' occur during the work, offering an interesting shift in our perception of the physical, as opposed to the mediatized body.

A further dislocation occurs towards the end of *PPPPPP* when no sound issues as a result of the depressed keys whilst the performers extend their gestural movements across the keyboards, crossing hands in order to reach extremities of parameters and gradually decelerating their hypnotic actions into stillness. Again we are aware of the separation between the four previously-mentioned 'bodies' no longer operating in a functional mode, the actor-body taking one course of action, the keys of the instrument-body being depressed, no sound issuing from the speaker-bodies, and the music-body being silenced.

At all events a permanent separation of sound from source is present throughout the piece, due to the prosthetic nature of these keyboard-bodies *without organs* that send digital signals to their small monitors and to the larger speakers placed at a distance around the circle. Perhaps it is precisely for this reason that we search for the equivalent of a visual sound-body in the small monitor loudspeaker-bodies facing inwards towards the centre, each pair projecting the sound of their attached keyboard in stereo diffusion. Virtual music, produced by means of electronics, replaces acoustic reality, simulating the sound of a piano by means of a digital code.

## 1. Methodology

### 2.1. The Relationship of the Spatial to the Temporal

My concern here is with 'an *acoustic choreography of space*' [author's italics] 'that […] has created new theatrical realities' (Schlichting 2002: 80, 'eine *akustische Choreographie des Raumes,* die […] neue theatralische Realitäten geschaffen hat'). Essentially the choreographic movements involved in unravelling and manipulating long rolls of score paper occupy both time and space. Moments of sudden stillness

in mid-action serve to intensify the experience of time and space on the part of the audience. The relative speeds of movement produced by six bodies in space are perceived within an overall temporal framework and highlighted by their opposite of stillness. We also see the perforations of a 'score' taking up their own space on the note-roll 'screen', the dots of light illuminated from behind. We hear the sound of rustling, crackling, billowing and swishing as each performer unfurls his/her own paper scroll. The audience becomes aware of connections between the two — this through the title and programme note. The scroll-objects have an intrinsic spatial quality as each performer enters from a different side of the area, creating a pathway through the audience that describes a different space and duration according to their particular modes of movement. The six keyboards are set in a circle together with their corresponding speakers, whose sound balance will vary according to where a listener stands within the arena. The addition of larger speakers diffusing the combined sound of six pianos from the edges of the performance space will enable a spatial distancing from that of the separate monitor speakers. An increased experience of sonic blending will be felt on moving towards the periphery of the space.

**2.2. The Relationship of Performer to Public**

The sensory experiences involved in the environmental perception of this work suggest a close affiliation with Deleuze and Guatarri's notion of haptic space, in which no opposition between the senses occurs (2004). 'The space that is […] created through our auditory experiences is always embodied, as it relates to our haptic sense' (Verstraete 2009: 202). Eliciting an engagement with the elements of composition involved recalls Merleau-Ponty when he points to the *body* of the experiencer as a medium for perception of the world (2003: 3-14). The audience are encouraged to move through the installation space, encountering performers and objects, sensing the movement of hanging paper and becoming aware of the visceral proximity of the performers as they pass by. All will be occupying the same space, certainly before the players sit at their instruments. The proximity is close, the audience perhaps being encouraged to help with tasks such as untangling paper rolls. A certain play comes into existence as all negotiate this mutual space whilst respecting the *ampleur* demanded by moving performers and objects. In a circus-

like formation, the stage of the players is also circled by the arena of the spectators, who are invited to move around constantly and watch or hear from different angles.

Looking over the back of one player to gaze on hands moving over a keyboard, we are aware of multiple viewing angles of the same activity offered by the circle, and sense the presence of a body in motion. At the same time we are aware of a disassociation between the resultant virtual sound and its generator, no longer being able to sense the physical process of its production on the part of the performer. Instead, the pianist becomes an indirect protagonist, almost a mime-artist, producing an imaginary sound-body for the audience to hear. However, we are deluded into accepting this temporary illusion of correspondence between a finger movement and a sound from a loudspeaker. The difference is highlighted at a moment in the piece where suddenly no resultant sound emerges from this action. Our focus on the musician changes as we become aware of the controlled gestures of their body no longer functioning on an operative level, but rather on the level of a performer.

The relationship between audience and performers borders on entertainment, humour, the spectacle of human virtuosity, excitement or unpredictability, at the same time adding a touch of irony reminiscent of circus, vaudeville, and silent film when moving images of the pianists are relayed to the audience as ghostly doubles whilst the live ones remain still. This is a moment of simultaneity where the live/ virtual connection between the two is perceived as an 'also-there' on the part of the public (Boenisch in Verstraete 2009: 172).

### 2.3. The Relationship of Performer to Instrument(s)

Six identical keyboards are played in very different ways by six performers. The question of corporeal materiality and differences with regard to musicians often seems to be ignored as a kind of tacit knowledge that remains undefined. As referred to in my previous chapter when discussing the performance presence of the viola player, it seems vital to apply an anthropological approach to matters of gender and sex when considering the physicality of instrument-playing and, by extension, the resultant sound. According to Laura Wahlford the pianist is 'an embodied subject-in-process,' a mediator, on whose body 'different historical and discursive meanings are inscribed' (2010: 28). Confronted with an electric keyboard

whose 'mechanism' is no longer palpable to the touch and whose sound emanates from loudspeakers, a pianist would have a very different sense of embodied authority towards the music that she/he interprets. In extension to this thought, Jin Hyun Kim offers some interesting light on interactive digital instruments in her description of an experimental musical interface that simulates the resonance of an instrumental body, thus producing 'vibro-tactile feedback' (Kim 2010: 116, 'vibrotaktilen Feedback(s)') to the player's body.

In terms of body movement, posture, gesture and eye contact between the members of the ensemble, the essence of performer-instrument relationships is clear in communicating an embodied expressivity. In order to emphasize a multiplicity of performance personae in this work, each pianist has a very definite musical role or character that interacts with the others — whether virtuosic, intrusive, or aggressive — stemming, in turn, from the compositional material. Parts 1 and 2 of the score, based on the original piano player part of *PPPPP*, reflect a complicity in their partnership in contrast to the mechanical piano-based parts of 3, 4, 5 and 6, whose role is comparable to a chorus or orchestra. During passages of suspended animation, where the gesture remains frozen in space until the player resumes playing, we witness several personal narratives cut short as the body holds its own *continuation* within that moment. Bettina Brandl-Risi refers to these 'moments captured as movement in stillness,' as the 'rhythmical, still-standing tableau vivant' (2009: 18) encountered in much contemporary theatre. The reaction on the part of the other pianists to this suspension of play ranges from the flamboyant, to the painstaking, to the aggressive, each embedded in the history of a performer's style and motor memory.

In another sense, I am asking for a separation between the musicians and the music itself, this relationship no longer being purely functional but leaving a space of interpretation on the part of the public. Gesture then becomes an opening of the musical narrative and not a direct consequence of it. An extreme example of this would be Xavier Le Roy's choreographic musical experience of 'conducting' an audience as his 'instrumentalists' during a recording of Stravinsky's *Sacre du Printemps* (Le Roy 2007). The connection between the music and the movement begins to oscillate as he generates this theatrical event with them. Thus the bodies of the audience, engaged in 'playing instruments,' are brought into the foreground,

and the relationship between seeing and hearing is shifted in this performative event of a concert.

This separation between performer and instrument relates directly to moments of 'silent' playing in *PPPPPP* (depressing a key with no resulting sound), of dislocating the gesture from the sound, so that what remains is its *imagined continuation* in the ears of the audience, following the contours of each player's hand movements until they gradually slow to a halt. The mechanism of the keyboard is still activated by the performer, but its volume has been reduced to nothing. (On a normal piano mechanism one would simply depress the key very slowly so that a lack of velocity causes insufficient rebound of the hammer on the strings).

### 2.4. The Relationship of Sound/Music to Visual Elements

Gesture is a term common to both the sonic and visual domains. In this work it is present in the graphic patterns perforated on to paper, some of whose data represents the musical structure. The music as we hear it contains many idiomatic gestures such as exaggerated glissandi, interjectory chords, or explosive successions of repeated notes.

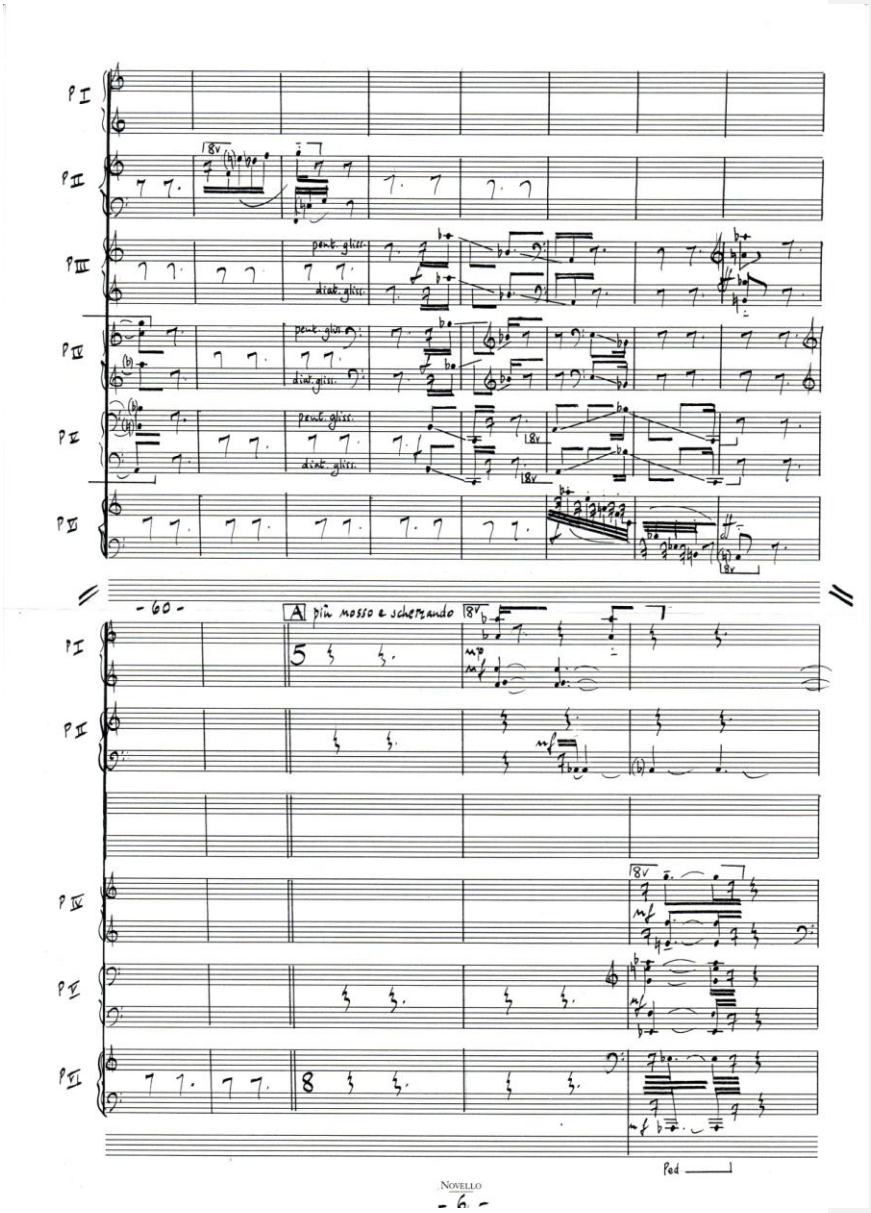



Figure 4.4: Page 6 from *PPPPPP* showing multiple glissandi figures, C. Wilkins.

We are aware of the expressive and communicative movements of the pianists interpreting this music. However, the process of transferring its data information from an electric instrument to a corresponding speaker gives a certain *virtual* quality to the source; it ceases to have any acoustic properties that make the

instrument resound. Placing larger speakers well away from the players in the 'field' frame of the area would emphasize this dislocation between sound and sight, taking the relatively local volume of the performance 'stage' into a bigger landscape of sound surrounding the arena in which the audience find themselves. We hear the diffused sound without necessarily being able to capture all of the visual events. The 'local' auditory frame, belonging to the intimacy of the immediate piano circle and perceived in conjunction with much visual action, spills over through the fluid borderline of the 'field', where we experience another story being told — that of the larger, magnified *circus of pianos* — whose music collides and dovetails in layers of convoluting sound, reminding us of the wild, constant clamour of Cage's 'circus' in *Roaratorio* (1979). As such, each 'frame' serves as 'an object of musical discourse' (Emmerson 2007: 98).

Another factor is the afore-mentioned technique of 'silent' playing, or the sudden shifts between movement and stillness, which cause the viewer to re-look, to re-hear in their memory, reflecting and filling the space of the narrative. This also applies to the opening of the work, where the performers move and play with sound objects in the form of rustling paper rolls. A parallel example from theatre would be the paper-strewn stage belonging to Martin Kusej's production of *Gespenstersonate* by Strindberg (Hamburg 2000). Here the material of the stage floor plays a musical role as an 'acoustic playing-partner for the actor, a space of resonance and a sound-body for the actor's body' (Roesner 2005: 144, 'akustischer Spielpartner für die Akteure, Resonanzraum und Klangkörper für den Schauspielkörper'). The stage space becomes a *sound space*, whereby every movement can be understood as a composed noise. Visually it is highlighted by moments of choreographed, sudden stillness written in deliberately as part of the movement-space score. Bodies become sculptures in space. We gaze.

According to Zofia Lissa (1969) a moment of silence in contemporary music is heard very differently to that of classical music because of the often-used technique of musical *punctuation* or fragmentation by composers, that changes our perception of flow. One has only to think of Morton Feldman, Earl Brown or John Cage, whose music from the 1960's and early 1970's drew a great deal of its influence from the visual arts, for example the spatial, multi-faceted form of the hanging mobile. Silence is intensified, the isolated sound structures appearing to be 'wrapped up' or sculpted in stillness, whereby their individual sound quality takes

on a more plastic character. The music of *PPPPPP*, with its sudden aggregates or collisions of sound followed by unexpected silences, certainly reflects this pattern. Moments of stillness in the work, where no movement or sound is produced, become tableaux, sharpening the eye of the audience as to the visual constellation of bodies and objects in the space.

On a visual level, musical data in the form of perforations on paper will suggest many images, gestures and sounds to the imaginative audience. However, the vital difference between piano rolls and graphic scores is of course namely that the former functions as an interface of exact notation and the latter is open to live interpretation. The tradition of making an open form score visible to an audience dates back to the Futurist movement and Luigi Russolo. Later into the twentieth century during the 1950s and 1960s composers such as Cage and the New York School experimented with film as a moving score and its projection during live performance. What links the two notational forms, piano rolls and graphic scores, is their presentation of space on paper, an example of the latter being Earle Brown's *December* (1952) with its three-dimensional approach to drawing sound in space. Chronological duration is literally measured in terms of space on paper on a piano roll, whereas the graphic score provides a relative dimension, a simultaneous picture of 'events' on a page. Both are the embodiment of a certain type of information, the former being a precursor of digital recording, the latter an example of determinate notation with indeterminate sonorous effects. Whether we compare Nancarrow or Cage, this practice reflects the fact that 'composers put together representations of sounds in other media' (Cook 1998: 269) before the use of audio technology, and not in sound itself.

The use of other media such as light projection and video to interweave within the scenography of the work is interesting for many reasons. Backlight projection through the perforations of the suspended note rolls changes the objects from purely functional interfaces into visual illuminations. A silent video film, projecting close up images of keyboards and hands enters like a ghost at the moment where the pianists are no longer producing sound, but only slow gestures, towards the end of the work. The perspective is deliberately altered as we see vertical keyboards and hands, or the circle of pianos rotating in space. Projected on to the floating note roll paper we witness images perforated with holes or lined by the minute gaps at the edges of each vertical sheet. This moment brings in a virtual dimension to what we

have just seen, another visual/aural reality that suspends, for an instant, our perception of space and time. Thus the notion of presence becomes a transitional space between the live and the digital performances, these virtual images transforming the live activity of the pianists into a *representation* of themselves.

**2.5. Objects – their Role, Placement in Space**

Objects deliberately placed in a *theatre of sound* allow new contexts and meanings to occur in the imagination of the audience. I refer here to Umberto Eco's concept of 'ostention' within the performative situation (1977: 107-117), whereby, according to Kattenbelt, 'objects […] function as intentional signs in the perspective of (a) possible world(s) or situation(s)' (Kattenbelt 2010: 30). The performance materials that go to make up *PPPPPP* have their own world of visual and sonic presences waiting to be discovered by an audience. Firstly, there is an outdated note-roll 'score', a non-functional, archaeological *object in space* installed together with objects belonging to the technological world of digital instruments and sound production. Lengths of perforated piano roll paper can take on multiple meanings and associations far removed from their original purpose. Here they adopt the double role of a miniature, permeable stage curtain for the performers and a screen. Lighting can be used effectively to focus on the *performing-paper-objects* suspended on transparent threads in the form of a graphic installation.

Secondly, on entering the performers each have a cylindrical object from which they unfurl reams of paper whilst moving through the space. Actions, such as shaking, rolling, or trailing the paper, elicit multiple visual and sonic gestures as they encircle the space and eventually install the score-rolls on the keyboards. This activity would also entail, by natural extension, interaction with the space of an audience in a live situation. Each object contains a score-part from which the performers play their music, unfurling the attached pages like a piano roll, pages which contain, however, standard musical notation. Each unwinding of the score allows the paper to descend over the keyboard into the centre gap created by the circle formation. I deliberately draw attention to its six-fold presence in the performance space by demanding an unorthodox manner of turning the pages. Instead of sliding behind the others in a neat book-like formation, the 'pages' extend in ever-increasing lengths and become part of the scenography of the work.

A visual link to the installed, suspended note-rolls is intentional, making of the score's functional role a scroll-like object that has its own presence in the space.

Finally, within the *mise en scène* these outdated objects are to be perceived in conjunction with the new technological ones, such as the six, almost human-size, monitor speakers placed on tripods and standing in a circle. These *object-beings*, each guarding a keyboard and aligned with the others in sonic complicity, demand a presence in their own right. Of course they have an undeniably functional purpose, but at the same time they take on a sculptural dimension within the installation framework: a 'head' mounted on a slim 'body,' a 'face' like the eye of a fly. Their deliberate placement in the space is highlighted by the use of focussed spotlights that identify and draw our attention to these curious features. We acknowledge their presence as sculptural forms, visual presences, waiting in silence before the arrival of the players.

### 2.6. An Aesthetic of Exteriorization

Here not only the 'mechanism' of the piano rolls is exteriorized, but also that of the players in relation to their instruments. The scrolls of hanging paper are examined like 'bodies' from all sides, not just the side that would normally feed into a player piano. They take on other aesthetic dimensions regarding their form, texture, transparency, colour, tracings. In this case they are not representational, having a purely dysfunctional role. Their working-sound is that of the material itself, the paper. Illuminations of microcosmic details from the perforations suggest another reading that no longer has anything to do with narrative. A dislocation of source from meaning takes place, leaving space for the audience to play with its inversion, subversion, fragmentation, in a process of turning the perforated information 'inside-out.'

At the moment where the players no longer play but simply move, their functional role as sound producers being suddenly dislodged, the 'mechanics' of their role becomes visible. The exterior workings of the body suggest mime, marionettes, automata, avatars. Parallel examples of this kind of dissociation between musician and instrument can be seen in *Thespian Play* (2008/9) by composer Falk Hübner (2010: 143-148) mentioned in chapter 1, and in a work by the afore-mentioned choreographer Xavier Le Roy, namely his *Mouvements pour*

*Lachenmann* (2005). Here, in an adaptation of Lachenmann's *Salut für Caldwell* (1977), two live musicians are hidden behind a screen whilst two others play 'air-guitar' in front of it; the physical production of music thus becoming exteriorized as choreography. Likewise, *PPPPPP* examines these issues in allowing the six performers to become actor-body-mechanisms, moving objects or performing actions which are, to some degree, detached from a musician's public role. Exteriorizing this latent side of concert performance involves making its scenic process consciously visible, and not hidden, to an audience.

The context of artistic presentation that concerns this work argues clearly for an environment that can facilitate its reception as an *encounter*. My pre-occupation with colliding historical and contemporary technologies, or with space in relation to sound and light, determines the multiple levels on which the music in this work can be embodied. Indeed, in this chapter I have deliberately chosen to apply terminologies across the disciplines in order to challenge our pre-conceptions and open up a meta-discourse between them. The human and the machine have featured largely in this context, combining together on inter-medial levels that shift our perception of the real and the virtual. A major role is taken by two terms: the *score-interface*, in its double capacity as a notational and a data-based object, and *object-bodies*. The complexity of such elements and their inter-relationships witnessed during a performance is undeniable. One can no longer consider their parallel existence as peripheral to the music, nor under-estimate the importance of a haptic level of experience when exposed to the physicality of sound, light and movement in space. This is indeed the key factor in determining a sense of embodied understanding when confronted with electronic media in a performance context. My plea here is for a critical use of new technologies that include the body, whether that of the performer or audience, in their discourse.

To continue my proposed dialogue between old and new media and their relationship to embodiment in music, I turn back in time once more to a precursor of piano rolls — the musical automaton. In their construction, mechanical musical instruments offered a visible, working body-of-sorts that reproduced popular melodies and became a source of socio-cultural fascination. My concern here is to lift the little machine, with its musical data implanted on a barrel and pin, into another context by renouncing its narrative function. Like the dysfunctional piano

rolls viewed in conjunction with digital keyboards, the musical box will be examined as a sound source whose mechanism comes into play with that of a historical instrument, the harpsichord, and with digital sound technology.

# Chapter 5

# Weaving the Soundscape

## 1. *Interweave*

This chapter concerns *Interweave*, a work that explores the different acoustic possibilities offered by live and recorded harpsichords together with the role of the performer. The process of interlacing various layers of sound recalls images of textiles on a weaving machine, the web of one material being perceived through that of another. In the same way the specific acoustic placement of live or recorded sound within the listening area allows one to hear a sound surface emerging through another according to the fluctuations of foreground and background and the play of perspective that they engender.

### 1.1. A Staged Concert

Vital to the process of determining the course of music in space is a consideration of the latter's acoustic properties, as defined in Chapter 1 by David Roesner's five sound spaces (2005: 130-131). An installation space, such as the one quoted earlier in the work by Saunders and Waltz, *Insideout* (2003), would be chosen according to the criteria demanded by the '*musical space*' (Roesner 2005: 131, *'musikalische Raum'*), whereas a staged concert is presented in a pre-determined space often shared by other works. However, the placement of sound sources in either version is crucial in creating the *sound theatre* of the event. A play or transformation between different sound spaces takes place from the audience point of listening. In the case of a staged concert some degree of sonic perspective can be set up in the space, whereby we hear one recording or live amplification in the presence of another.

In *Interweave* my choice of, and reasons for, sound distribution over six speakers are based on the *'sound-room'* (ibid: *'Tonort'*), meaning the actual music as it should be heard in the particular acoustics of the space with or without the addition of some electronic manipulation. In this case, one of the pre-recorded parts will be diffused through speakers 1 and 2, followed by a pre-recording of musical boxes

that ends the piece. This sound perspective is the most distanced of the three from an audience vantage point, suggesting a resonant room that echoes in response. The second pre-recorded part will be diffused through speakers 3 and 4, offering a slightly closer audio perspective through which we can still perceive the more distant texture of the first. All live amplification will take place through speakers 5 and 6, the sparse material of the harpsichord part offering a commentary on the other two recordings whilst allowing us to hear their different acoustic layers, and the miniature sounds of the live toy musical box being vastly magnified in volume. This decision was made according to Roesner's final definition of space — the *'tonal space'* (ibid: *'Tonraum'*), meaning the compositional placing of sounds, whether sparse or crowded, within the actual musical material. The deliberate choice of setting the live instrument at a great distance to its amplification over speakers defies any attempt on the part of the audience to double the aural localization of the sound with its visual placement onstage. An action is performed centre upstage whose sonic results are heard to left and right further down the auditorium. Thus three layers of harpsichord sound emanating from distant, middle and near sources are perceived in their *interweaving* with each other as they permeate the space surrounding the audience.

### 1.2. The Acousmatic

According to Steven Connor (2000) the prevailing use of audio technologies in performance has revived our fascination with the powerful, the excessive and the uncanny. This is particularly the case when sound is dissociated from its source and we become subject to a 'process of re-enchantment' through its invisibility, its 'magical artificiality' (40). Such is the case with a miniscule music machine hidden from audience view, whose sound is magnified and diffused by means of technology. Equally, the different acoustic 'rooms' of each pre-recorded harpsichord, whose timbres have been altered to sound slightly artificial, adds a surreal element to their virtual sonic presence. Differences in timbre quicken the ear, alerting us to a change of 'body'.

Michel Chion defines the word *acousmatic* as 'sounds one hears without seeing their originating cause' (1994: 71). For Pierre Schaeffer these sounds are objects (Schaeffer in Chion 1983: 20), the equivalent of a photo, like 'pieces of time torn

from the cosmos' (Toop 2004: 67). However, I would argue against this approach to sound in my music theatre works, insisting instead on the material source of the sound-*body*. A case in point would be the insistence on the 'working sound' of both the gramophone in *Phonurgia* and the toy musical box in *Interweave.* Whereas Schaeffer would concentrate on the so-called 'locked groove' of the shellac disc as a fragmented time-segment, a 'loop' abstracted out of its original context, I would acknowledge this context by pointing to the sound's immediacy, its particular characteristics and imperfections that indicate a 'body' behind it. An earlier reference to Nick Caswell on acousmatic music in chapter 3 cites this difference in approach; what he terms as the 'extrinsic quality of sound' (2010: 4) interests me in the context of music theatre, as it allows for a free association between the senses on the part of the receptor. Schaeffer's notion of reduced listening (in Chion 1983: 34), the equivalent of Caswell's 'intrinsic quality' (2010: ibid.), concentrates on the act of hearing a sound in itself, of entering into its timbral nuances and perceiving its innate structure. The sound theatre of Craig Vear (2009), mentioned in chapter 1, takes an interesting position on acousmatics in relation to the above. Closer to Caswell's extrinsic approach, the 'theatre' lies here in the creative listening act on the part of the audience to evoke images and a sense of imaginary places.

In *Interweave* we are confronted by the shifted timbres of two pre-recorded harpsichords by means of electronic processing. They no longer sound exactly like the instrument played on stage, adopting something of a magnified metallic quality or an echoing, distant, resonant chamber interior. Two virtual room acoustics are produced that enter into dialogue with the amplified live instrument of the concert space. Our ears are confounded by the opening sounds of the work, emanating from an unseen source because of its size. The minute musical box placed on the harpsichord is all but concealed from us by the performer's hands as she operates the turning handle very slowly. However its resultant sound, diffused over two speakers placed in closest proximity to the audience, is magnified out of all proportion. It returns in virtual form towards the end of the work, heard this time from speakers placed at a greater distance to the audience. Here it has been pre-recorded in layers and mixed on to stereo tracks, so that we hear multiple metallic clicks of the comb as it plucks a pin on the tiny cylinder at such a slow tempo that no melodic line is discernible, only the occasional resonance of a pitched note.

### 1.3. Chiasm

Of all the mechanisms pertaining to both musical and mechanical instruments, those of plucking either a string or a metal pin would seem to be the most tactile of sounds. Their action, caused by a plectrum or series of metal tongues, has replaced that of the human finger. Perhaps it is for this reason that our ears relay a kinaesthetic sense of being touched, and in turn, of touching, certain sounds. Merleau-Ponty's 'chiasm' (2004), referred to in chapter 3 in relation to the listener's body, can also be applied to that of the body and technology in their co-existence during a mediatized performance. A unifying dynamic of interdependence and mutual exchange between them dissolves any separation of modes in theatre, leading to new forms of embodiment and subjectivity. The live/mediated, the real/virtual, the physical/technical, all cross paths in the mind of the audience, inviting a corporeal response to, and engagement with, the event. By its very title *Interweave* invites a haptic approach to listening, its multiple textures of live and virtual instruments forming layers of tactile sound in their timbres, all based on a simple mechanism of plucking. The first few sounds from a metal barrel and pin, vastly slowed down, prepare us for the complexity of multiple plectra striking strings at different speeds.

And so to the experience of the musician confronted with these new forms of performance practice, to the shifting relation of the instrument towards an electronic *other* that has been sonically modified, represented in the case of *Interweave* by the pre-recorded harpsichords. Although not processed in real time, these sonic layers of virtual and real instrumental timbre still pass through a mixing desk before being relayed over speakers, and are thus submitted to certain parameters of control. The performer has to be able to hear her virtual counterparts in order to respond on multiple levels that involve not only playing the instrument but moving in the space, activities that demand both a sense of timing and spatial awareness.

I would like to draw a parallel here between cinematic and sonic re-mediation in performance. The presence of live cameras during performance can focus on actors, offering simultaneous projections from different viewpoints, including 'close-ups' that alter our reception of events onstage. The live visual event is present along with multiple perspectives of its digital image. On a sonic level, *Interweave* presents us with a live instrument along with its re-mediated virtual instruments, whose sounds

issue simultaneously from different corners of the space, whether far away offering a distant response, or close to the audience, offering a magnification. Thus the live instrument is presented together with a myriad of its own sonic perspectives, the only difference being that this re-mediation is not taking place in real time using live electronics, but controlled, along with the live amplified instrument, by a live mixing process.

### 1.4. The Musical Persona

The work is as much about the harpsichordist as it is concerned with the instrument. In fact I often wonder why we composers give titles to our works that disclaim the normally vital human presence of the one in relation to the other, unless we are referring to machine-operated instruments. As such, I am interested in the performative aspects of a musician's presence, a perspective that takes the whole performing body into consideration, whether it is moving, speaking, or by extension, playing an instrument. Another decisive factor in presenting a work of sound theatre is my wish to dislocate sound from its visual representation so that each element can develop its own dramaturgy during the course of the piece. Thus stems my interest in combining pre-recorded and live sound, or hiding acoustic sound sources from audience view.

How do we perceive a musician when they are not only fulfilling one role but unfolding many more aspects of themselves? Of course one could argue that these are implicit in the act of playing and therefore readable as characteristics of his or her style. However, my interest lies in separating this amalgam and opening up the traces of personal history that go to make up every performer, this in order to explain why I would wish to choreograph a musician whose movements are normally determined by musical parameters. The traditional separation between the two disciplines becomes blurred in a moment of visual configuration that confounds any expectations of role-playing.

In *Interweave* it is the deliberate sparseness of the live harpsichord part that allows room for a dramaturgy to emerge and develop on the part of the performer when she is not playing. On a visual level this includes sitting motionless whilst the relayed harpsichords sound busily from four speakers, suspended slow motion of habitual hand movements across the keyboard (including crossing hands and

changing register stops), or slow repetitive motions of endless page-turning. She stands near or at a distance to the instrument in profile/back/front, walks slowly/quickly across the stage and disappears in the wings, or play a short passage on the keyboard whilst standing in front of it. At one moment she sits on the floor, her back leaning against one of the legs of the instrument, remaining very still.

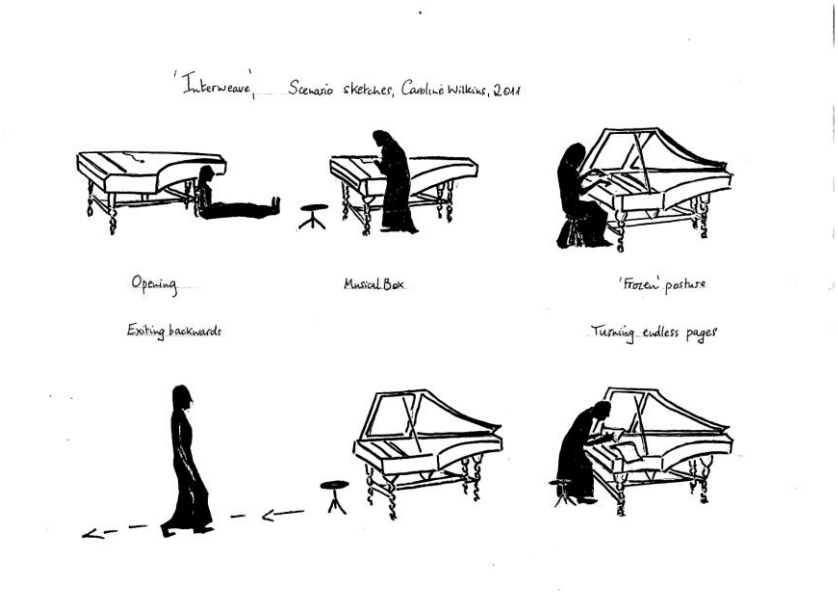



Figure 5.1: Scenario sketches for *Interweave*, C. Wilkins.

A scenario is taking place that leads her from one task to the next. These choreographic ideas suggest the development of the performer as a persona who constructs her imaginary theatre of sound. They free her from one role without replacing it with other more difficult tasks that require some skill, and allow for a personal contribution to manifest itself in the form of an embodied, unfolding history that gives room for audience interpretation. Choreography is not linked directly to the production of sound, resulting in a 'complementation' between the two 'media as independent dimensions of variance' (Cook 1998: 263). Cook uses this term in a contextual sense to describe the existence of 'mutual gaps' (ibid.) within each medium that avoid a situation of conflict between them. I interpret these 'gaps' to be spaces that allow for the emergence of meaning by one medium in the presence of another.

Sound theatre, whether in the form of staged concert or concert installation, presents us with a dilemma regarding our possible modes of listening. Do we perceive the work on an oral or literate basis, as a concert or a representation (Verstraete 2009: 167)? The musical persona is both a performer and a character in *Interweave*, which means that we not only listen to her music but also watch her movement. The oral listener/spectator will engage themselves in the dynamic drama of sounds and images conjured up by the performance, focussing on their own embodied experience. A literate audience 'reads' the musical signs, both concentrating on their interpretation by the performer and listening for the composer's intentions. Whereas a concert offers a musical performance, a representational mode offers us the possibility of a narrative within. Music/sound can generate a sense of this without, however, resorting to it directly. In relation to the other elements of performance it opens up a space which each listener fills according to their realm of experience. Barthes and Havas refer to this as the 'shimmering of signifiers' that makes us aware of our role as listening subjects (1991: 259). Indeed the music of Cage, for example, externalizes the act of listening itself, so that we are obliged to hear ourselves in relation to his vertical blocks of signifying sound. Placed within the context of post-dramatic theatre, whose importance I emphasized in my introductory chapter, the same applies to our visual perception of a performance of music theatre. Our own interpretative mechanisms suddenly become conscious to ourselves, as we acknowledge personal experience that is evoked by our ability to read into an event rather than be guided by an author's narration.

### 1.5. A Mechanical 'Beast'

The harpsichord has a historical connection to parallel inventions of mechanical musical instruments from the 1500s to the 1700s by Athanasius Kircher, Caspar Schott, Robert Fludd and Salomon de Cau amongst others. Acoustically speaking its sound is contained, miniature, heard from within a casket, as are the sounds of the serinette, musical box, barrel organ or orchestrion. A mechanical spinet, operated by a barrel and pin mechanism, was invented by Samuel Bidermann in 1600, the same year that saw the invention of a mechanical harp and lute by Robert

Fludd. In fact a strong historical relation exists to the early French tradition of harpsichord writing, where the instrument was perceived as a kind of mechanized lute that was capable of expressing grades of emotion. One is reminded of a mechanical 'beast' set into motion, at one moment a glittering orchestrion, at another a dry-sounding lute mechanism. An undisguised, basic mechanism is allowed to speak for itself.

To hear the body of a sound means to acknowledge its physical source — its context — from which stems its particular diction or enunciation. I am interested in exteriorizing certain sounds of a harpsichord that are produced by the escapement action, plucking mechanism, note repetition, the arpeggio spectrum and the terraced effect of register and manual changes, all aspects that lend themselves well to a comparison with mechanical instruments. The first two characteristics, both essentially the working sounds of the instrument, can be acoustically magnified by amplification. An emphasis on extraneous sounds alongside the actual note played acknowledges the corporeality of an instrument, the 'turning inside out, like a glove' (Barthes 1984: 176). The sound diffusion of toy musical boxes, for example, heard towards the end of *Interweave*, stems from a recording made by placing the tiny mechanisms on large cymbals that act as metallic resonators, magnifying their miniature working sound. Fast single-note repetition is a factor made possible by the harpsichord manuals, drawing parallels with that of a barrel-organ repetition or a player piano.

In addition the overlapping effect of repeated pitches is emphasized by a possible tone-colour contrast of manuals and registers, evoking an image of interlocking wheels all at different speeds or movement. It is interesting to note that not all of the strings are actually technically plucked at the same moment on playing a chord, but always with a slight, imperceptible arpeggio, so that the sound is fuller, richer. The wide spectrum between slow and abrupt arpeggios invites comparison with the vertical aggregates of sound produced by the musical data of a barrel and pin mechanism. Finally, the terracing effect of tone colours through register and manual changes are applied through purely mechanized shifts or gradations and not by variations of finger pressure.

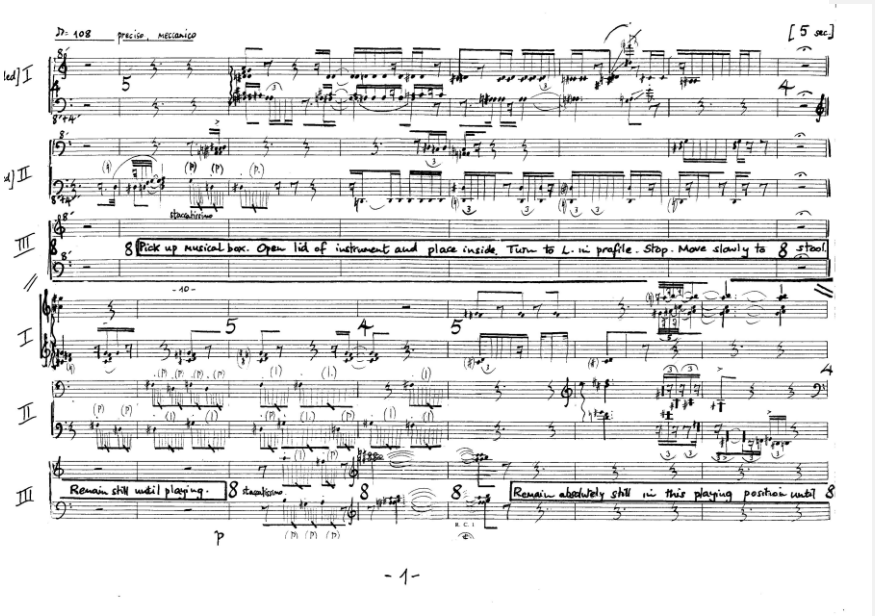



Figure 5.2: 1st page of score, *Interweave*, C. Wilkins.

### 1.6. Automata

The sound that activates the mechanism of a musical box can be heard both in a historical context and in relation to the present. The possibilities of re-connecting and colliding different eras of music in order to create new meaning has led me to explore early methods of sound reproduction such as 19th century mechanical instruments. The fact that these automata have an undeniable living quality in the way that they exist is of tremendous relevance to music now. That they can be part of a living performance environment, surrounded by contact of touch, eye and ear, constantly worked, moved and played, is in stark opposition to their archival place in the museum. That they can be allowed to 'speak' for themselves without categorization of label or glass case and understood with respect to each working part, their differences and eccentricities in sound remaining an integral part of their identity without recourse to standardization, opens up the possibility of a new discourse with contemporary aesthetics. I am reminded of Hans-Dieter Bahr's essay *Le Rossignol et le Robot* (1982), in which he refers to inventions of the past as being historically and culturally limited to the context in which they came into

being. Thus a whole realm of absent and unsuspected applications which were not practiced at the time can be re-discovered from a present-day perspective, this through a process of lifting-out of a previous function.

Both the winding-up mechanisms of the gramophone, as in *Phonurgia*, and the musical box in *Interweave*, are essentially undisguised in their working processes, bringing an extraordinarily objective quality to the music. At the same time there is also a sense of removal, of absence, within the movement of the mechanism, an obsessive repetition which is both awkward and seductive in its reversibility. I purposefully disconnect the musical narrative from its working sound in order to shift the context of the latter and thereby draw attention to its body as a sound in itself, with infinite possible meanings. A case in point would be the comb of the musical box, which is deliberately loosened from its fixed position, thereby causing it to vibrate wildly as it comes into uneven contact with the barrel mechanism. The resulting sound jangles like a snare-drum rattle and produces a series of percussive, metallic clicks instead of pitches. Through enhancing or exaggerating the inbuilt imperfections of mechanical instruments and machines, I ask the listener to identify with the actual sound processes involved in their innate physicality, deliberately unsettling any expectations of a functional narrative. Abrupt changes in a mechanism, causing it to repeat, wind down, miss a few notes or stop suddenly, dislocate the relation of speed to time. The comb locks with the barrel, the pick-up revolves endlessly in a faulty groove, the winding mechanism cranks audibly, the pitch undulates; there is a sense of several speeds happening at once besides the tempo of the music, like a series of wheels that turn in different directions simultaneously.

However, in contrast to its diaphragm-equipped descendent, the automaton still 'had a body of sorts and looked like itself' (Satz 2010: 76). As Satz goes on to relate, a visible performing mechanical automaton became replaced by the pianola, whose nuances of tempo and dynamic were operated by pedalling human feet in conjunction with hand levers, and then rapidly by the invisible script of sound frequencies on to a wax cylinder or shellac disc. Thus our notion of music's embodiment in machines of sound reproduction underwent a rapid shift into the abstract world of technology, bringing a new aesthetic of the *sound-body* with each accelerating refinement.

## 2. Methodology

### 2.1. The Relationship of the Spatial to the Temporal

In this work the division of material space into the real and the virtual happens on a sonic level. The real space is occupied by a harpsichord placed centre upstage, whilst the virtual spaces issue from speakers placed upstage, centre stage and downstage at an increased distance from each other so as to engender their sonic overlapping. Due to the timbral differences between each instrument, those of the electronically-processed virtual instruments and the amplified harpsichord, a sense of three different acoustic 'rooms' becomes perceptible to the audience. The first, situated near to the public, resembles an acoustic proximity to the live harpsichord. Through this we hear the second 'room' centre stage, taking our ears into the mechanistic world of the virtual instrument's internal workings and magnifying our aural focus like the visual zoom of a camera. Finally a third 'room' is located upstage, from which another virtual instrument responds from a place of resonant distance to the others. A spatial break is apparent between the real location of the instrument being played and its amplification over speakers positioned at the furthest distance away from the source.

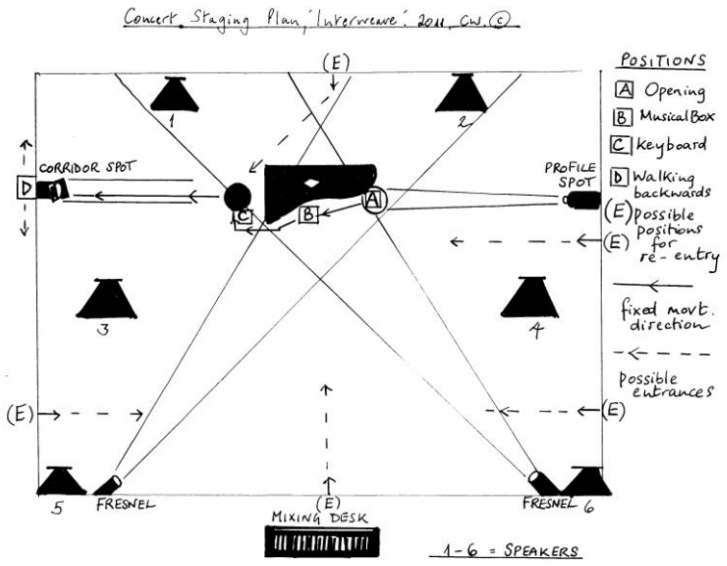



Figure: 5.3: Staging details, *Interweave,* C. Wilkins.

The same applies even more so to the physical placement of the toy musical box on the instrument's wooden casing; the former's miniature sound, relayed over the same pair of speakers, is deliberately magnified out of all proportion to its size. Our sense of space, normally dependent on acoustic perspective, is distorted and confounded by the seeming proximity of this virtual, imaginary sound body. Here time is distributed in space by means of extension, repetition and simultaneity, resulting in a new temporality of performance. Its theoretical source stems from Deleuze's concept of the 'fold' (2006) as outlined in chapter 1, whereby the existence of parallel space-times within a piece of music can be likened to multiple inner folds contained within its structure that unfold themselves independently to the auditor. Subjectively, the listener finds him-/herself both inside and outside each of the three acoustic 'rooms' emanating from the different speakers, this by means of a virtual extension of their normal auditory perspective. Indeed the live part of *Interweave* has an almost improvisatory nature, entries and durations issuing from the performer's own sense of timing and play as well as a 'feel' for the overall duration of the other parts.

My concern here is with the performative dimension of our reception of music theatre within *time-space*, a time that is no longer perceived as linear but as parallel multiplicities. A performance of this work becomes like witnessing a frame of simultaneity within the duration of a lived present, a 'now' that exists as 'a space within time itself' (Varela in Hansen 2004: 250). Repetition occurs in some of the fast passages of the harpsichord writing as well as being implicit in the slow turnings of the endless musical box pitches played by the performer, later heard in a more complex version towards the end of the piece. In both cases time is extended by either filling in the musical space of duration or stretching out the actual tempo of the music. Our aural-spatial perception is enlarged accordingly, altering our sense of time. Indeed the re-occurrence of sound material within the work, such as described above, serves to alert the memory to an altered space of familiarity.

'Machine-time' (ibid.), offered by means of technology, enlarges this frame of the 'now' by expanding our embodied perception of complex multiplicities that can be absorbed on more than one level, that of chronometric time. Different musical information issuing from six speakers saturates a moment in time, enlarging it, fragmenting it into multiple parts, so that our aural perception is heightened. Hence, technology has offered an electronic prosthesis of sound that extends our sense of

embodied awareness as listeners. We hear these virtual 'rooms', relayed from different loudspeakers, as though we were simultaneously present in each and re-creating for ourselves an imaginary body of sound. Moreover, during a performance we are able to shift our perspective from one of localized identification to that of a more panoramic audio-point, enabling us to hear the whole sonic architecture from a distance. According to post-human philosophy it is these parameters of technology, belonging to a cognitive system, that have caused our human functionality to expand (Hutchins 1995).

**2.2. The Relationship of Performer to Public**

There is something of a complexity involved in the layers of communication operating between performer and public when the traditional parameters of music presentation are opened up. We are confronted with multiple levels of relationship — those of the performer-body in space, dynamic of movement, gesture with or without sound, and the possibility of a narrative, for example. An audience member will 'read' a personal scenario of events through these means, identifying to a lesser or greater degree with the protagonist and supplying their own inner narrative accordingly. No longer possible to acknowledge is the purely functional role of a musician's expressivity in the face of a musical score. We are allowed behind the single dimensionality of a performer to witness other, more subtle aspects that remain perhaps inexplicable at the time and rest on a metonymic level of interpretation. The oral spectator/listener will focus on the musician sitting on the floor leaning against the instrument, the silent pose of the performer's body drawing in her/his attention as they gaze. A *time-image* is evoked in this moment, meaning a temporary sense of another dimension of time existing outside of the present, in which personal memory recalls a similar image to the one actually seen (Deleuze 2005). The literate auditor will focus on the malfunctioning musical box clattering and jangling in its unsuccessful attempt to produce a melodic narrative, whilst others will imagine its form, half-hidden from view.

As the performer suddenly moves back from the instrument, rising from the stool whilst the virtual instruments continue their incessant music, the public will read this gesture as one of removal or separation from the musical space. On a dramatic level it could be interpreted as fear or anger, intimidation or surprise. However my

intention is not to 'colour' the choreography with too much meaning and allow both performer and audience room for a neutral space of interpretation. The traditional role of a musician's exits and entrances is deliberately confounded in this work when the performer re-enters from another angle of the stage whilst the music continues. She is suddenly perceived by the audience in another role, that of a protagonist re-taking the stage in her dimension as an actor/performer and not as a musician 'pinned' to her instrument. This again is a moment when we sense her relationship to the space, to the instrument, to the music, and importantly, to us as the audience, from whose midst she seems to emerge. There is an almost hypnotic relationship that develops between performer and audience as the latter watches endless, repetitive gestures of slow-motion 'playing' and page turning. We are drawn into the quasi automata-like nature of these purely dysfunctional movements and follow their tempo in stark contrast to the fast-moving music issuing from loudspeakers, suddenly surprised by the musician's occasional live interjections on the keyboard from her standing position.

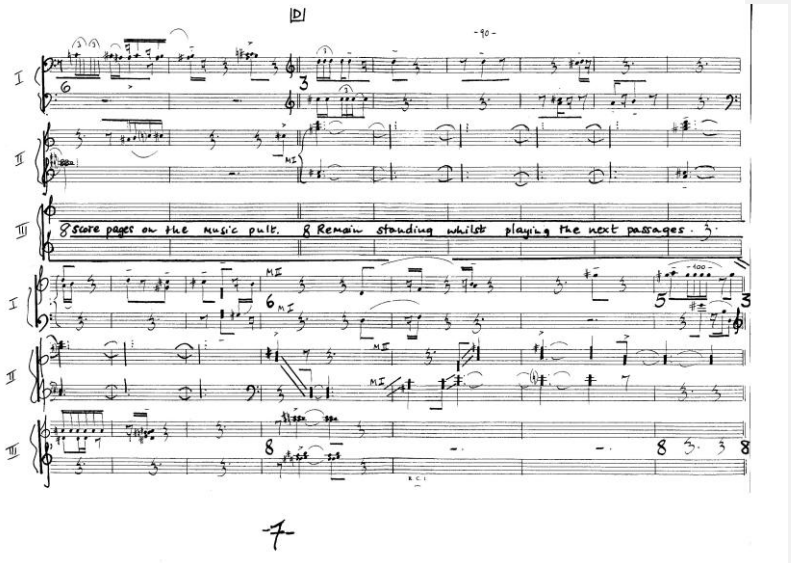



Figure 5.4: score excerpt with choreographic indications, p. 7, *Interweave.* C. Wilkins.

### 2.3. The Relationship of Performer to Instrument(s)

In this work I am concerned with an essentially corporeal relationship between the musician and the harpsichord that offers a contrast to the instrument's invisible, virtual counterparts relayed over loudspeakers. Opening with the close physical proximity of the two, her back supported by the tail leg of the instrument, we are confronted with two 'bodies', that of the 'mechanical beast' and that of a reclining human figure. Their configuration in space defies all notions of functionality, obliging us to re-imagine a context for this apparent connection. For an instant, forgetting the context of the concert and looking anew, we may imagine that a dancer/actor is about to open a scene, all the more so as this visual detail has been heightened by a profile spotlight. The surrounding space remains in darkness, divorced from the overall concert-stage reality of instrument, stool, microphones and speakers.

The toy musical box seems to be an intimate part of the 'mechanical beast' as the performer operates it from within the larger instrument's 'casket'. Its microcosm presents a stark, visual contrast, both to the human body bending over the task of winding a miniature handle and to the harpsichord itself. In a temporary separation of functionality between performer and instrument, the former standing to one side as the latter begins its virtual music over loudspeakers, a multi-faceted relationship is engendered. Visual presence and sonic mediation play together in a renewed constellation. A reversal of aural/visual cause and effect takes place, the performer no longer generating sound in the same way that an actor would speak onstage, but being in a sense *generated by* it. Another space opens up in the dramaturgical relationship between musician and instrument.

### 2.4. The Relationship of Sound/Music to Visual Elements

The opening scene of *Interweave* offers a deliberate separation of audio and visual material. Silence accentuates our focus on the reclining performer bathed in light. The first sound source, in the form of greatly-amplified metallic sounds of a dysfunctional musical box, is deliberately hidden from view by the performer's back. We are not certain if the source is live or pre-recorded even though we may guess what its origin may be. I refer here to Eric Salzman's analysis of *Max Black*

(1998) by Heiner Goebbels, where he points to an effect of dramaturgical complexity that results from this kind of uncertainty (2008: 298-302). Furthermore, the composer's deliberate over-amplification of small sounds — such as tiny movements of the hands encountering objects — distorts our sense of acoustic proportion when heard in comparison with a normal amplification of large objects. Such is the case with *Interweave* when the 'overlarge' sonic body of a musical box is followed by a harpsichord sound that seems to resemble its size.

A deliberate dislocation between our aural-visual perception of the live instrument, heard in one part of the auditorium and seen in another, generates the existence of two autonomous 'bodies', that of the musician and that of the music. It allows us to imagine their independent narratives in parallel without fusing visual movement and sound into one representative amalgam. Their relationship is made all the more complex by the existence of further 'bodies of sound' in the form of virtual harpsichords, so that any attempt at a synchronization of the senses is replaced by a shift in our mode of reception. Listening-in-search is replaced by an evenly hovering attention that no longer seeks for cause and effect but plays with the possibility of alternative meanings (Lehmann 2006, Barthes and Havas 1991).

There are moments when it is clear, however, that the performer is not playing her instrument. A 'frozen' gesture, caught after the striking of a chord, is suspended in mid-air for thirty seconds before she repeats the same chord. Something of a time-lapse occurs. In the meantime the dense web of pre-recorded harpsichord music continues. It is as if their persistence drives the musician from her place at the keyboard, forcing her backwards out of the scenario, until she appears at a later moment from another, perhaps more neutral, point of entrance. As she endlessly turns page of a score whilst standing, we are shown a moment of rehearsal typical of performance practice. This moment represents a visual cameo from another time, inserted into that of the present, relentless, ongoing music. Likewise, the harpsichordist's playing gestures at the keyboard, exaggerated in slow-motion and completely de-synchronized from the pre-recorded sound offer a parallel, visual counterpoint to the music.

Perhaps the closest we come to any kind of aural-visual synchronicity is near the end of the work, when the musician is very clearly responding to the recorded instrument. This is a moment of stillness and contemplation, in stark contrast to what has gone before, when each part seems to enter into a dialogue with the other.

The music is coloured by the ambience of pre-recorded musical boxes that remind us of the presence of the miniature toy that opened the piece. No longer attempting to identify their physical location in the space, we accept their sonic multiplicity as an imaginary echo of what has gone before.

### 2.5. Objects – their Role, Placement in Space

In chapter 1 I referred to a *Theatre of Objects* as a distinct characteristic of post-dramatic theatre, whereby metaphoric narrative is replaced by tableaux, montage and *placement* in the performance space. Thus each element that goes to make up the visual and sonic scenography can become an object in itself, once-removed from a purely functional role. Lehmann's theory of demounting stage and auditorium space (2006: 122) had a far-reaching effect on the development of all forms of theatre, and led to the term *concert installation* in works that explored the musical and theatrical potentials of a 'found' space as opposed to an auditorium. However a staged concert version of *Interweave*, where other works are presented during the same programme, poses a difficulty in terms of re-contextualizing a space. The possible visual and aural encounters between a mobile public and objects in the former environment become limited to the confines of a seated audience focussed on one part of the room. However, the presence of six loudspeaker-objects around the space, each pair diffusing different sonic material from their source, does something to appease this dilemma. Each musical part unfolds itself in the localized sound space and plays with a visual counterpart offered by the staged action.

Practically hidden from audience view, the miniscule object in the form of a toy musical box offers a link to the socio-historical past of mechanical instruments. It is a reminder of old technology brought into the present and combined with the new in the form of electronic processing and amplification. The archaeology of media allows us to re-discover our findings and re-examine the old within a context of the new (Zielinski 2006). Indeed, Diderot's story, quoted in chapter 1, of the instrument that could remember all that had been played upon it foretells the development of music technology from as early as 1769. It suggests the notion of *object-beings* — automata capable of reproducing movement or sound — that pose

an existential question with regard to their potential capacity for thinking and their material likeness to the human body.

The *score-object*, witnessed in *PPPPPP*, makes its appearance once again in *Interweave*, this time in a more moderate form. Placed on the surface of the harpsichord, this large, embossed form becomes an object of focus as the musician slowly takes it and stands, pondering over its pages, turning them endlessly. Clearly divorced from any functional role within the actual course of the music, its exaggerated presence reminds us of an essential ingredient to a performance that is normally dismissed. We are presented with something of an action existing outside of time, the slow, controlled movements of the performer as she unfurls each page providing a contrasting tempo to that of the busy harpsichords.

### 2.6. An Aesthetic of Exteriorization

Barthes' 'turning inside out like a glove' (1984: 176) quoted earlier in this chapter, manifests itself no more clearly than in the sonic treatment of *Interweave.* One of the instruments has been recorded closely then electronically processed to resemble the internal timbre of a mechanical musical box. The effect on hearing this over loudspeakers is one of exposure to the source's internal workings, that of a plectrum plucking a string or the escapement action of the jacks. Their thin, percussive, slightly metallic quality is heightened by the introduction of additional treble frequencies into the sound spectrum. The same technique of close recording is used for the musical box material heard towards the end of the work. Over-amplification of the prepared live musical box at the beginning makes us aware of its audible presence as a medium, a machine whose working function is undisguised. We catch ourselves in the act of listening to these vertical aggregates of sound, a process which surely has parallels with that described by Jean-Luc Nancy as the self becoming the resonance of a return (Nancy 2007: 9). To exteriorize the reception of sound would then mean that we no longer hear it as an object to be analysed from our position as subject, but rather in its capacity to refer infinitely to our stored embodied experience.

Indeed, the relation between sonic and visual elements in the work is turned inside out when their synchronicity is no longer evident. At times the musician is revealing moments from her performative history whilst the music continues on

another plane. We see the 'mechanics' of movement without sound as she plays her instrument silently, her pre-occupation with turning the pages of a score, or her unexpected movement away from the harpsichord that confounds our notion of her role. What is normally hidden from view, according to concert *etiquette*, becomes the subject of the piece. Although writing on the operatic voice, Michelle Duncan draws, for me, a parallel with these ideas in her emphasis on the body's very being-in-the-world during performance (Duncan 2004). Her concern with presence and performativity in relation to the singer resonates strongly with those of the musician, whose potential complexity as a performer can be revealed in order to engage us on several levels.

*Interweave* raises a number of issues that have been touched upon in previous chapters, although its instrumentation pre-dates all of them. Both the harpsichord and a mechanical musical instrument belong historically to different eras that existed before the discovery of sound waves announced by Edison at the end of the 19th century. Thus their temporal juxtaposition with the new medium of audio technology is all the more enhanced within the context of a contemporary work. Here I have argued for a re-appropriation of old media, faced with an awareness of what we can learn from them and the possibilities offered to us by technological tools. As supported by some of the theoretical sources quoted, my argument is that they offer us a form of embodiment before the abstraction of sound through technology. This serves both to remind us of the radical aesthetic changes that have taken place during the course of history and to contextualize our present concerns with the virtual sound body. Finishing with a work that encapsulates my concern with the mechanical and the machine-body, it remains for me to turn to this collection of works that comprises four chapters and draw some conclusions as to their overriding theme.

# Conclusion

In this final part I shall return to the three main questions raised in my introduction, summarize how they have been addressed in the intervening chapters and present some arguments for their solutions based on my discoveries. Furthermore, the works will be assessed in terms of their results and reflected on in terms of their future development. I shall conclude with a brief personal statement on the shift of praxis that has occurred in my compositional process.

The role of embodiment within the practice of new forms of sound/music theatre involving media technology has been an overriding theme, examined in the context of the creation, performance and reception of a work. My concern addresses issues regarding its definition within interdisciplinary skills, its relation to methods of inter-medial discourse and analysis, and its role within processes of notation. Firstly I propose to begin by examining the internal, emergent themes that have resulted from four sound theatre compositions, re-address each of the theoretical questions that were posed externally prior to commencing the artistic work, demonstrate some solutions through direct reference to the practice, and finally summarize my findings based on an integration of the two approaches. Throughout this conclusion I shall contextualize my own work in relation to that of other contemporary practitioners and recall certain theorists whose ideas have underpinned the key issues raised during the course of the thesis.

Reflecting on the thematic link between each of the chapters that clearly traces a historical lineage backwards in time — from the digital technology of the first work through to its juxtaposition with analogue sources, to old musical data, music machines and finally a musical automaton — I asked myself why such an underlying fascination with these materials seems to recur in my compositions. The resulting answers provided a key to the overriding theme of this thesis, linking the relatively unconscious processes involved in composition with conscious reasons for their decision making. Basically they concern three factors: a medial discourse between the old and the new, a temporal discourse between the past and the present, and a transformation of the concept of the body.

Beginning with the latter point, which is indeed the main subject of my title, I would argue that it is the undeniable materiality and visibility of early music

machines and data that have affirmed the existence of a 'body', used here in an extended sense of the term. Thus their juxtaposition with the invisibility of digital sound produced by electric keyboards in *PPPPPP*, the computer in *Zaum: Beyond Mind*, or multiple loudspeakers in *Interweave*, presents a connection between the physical and the virtual. Removed from a former museum environment and placed within the context of a performance space, they assume a different presence whilst retaining, at the same time, all of their history. The same could be said of old musical instruments, such as the bandoneon or indeed the harpsichord, the former becoming a body-extension of the performer and the latter an instrument-body against which the performer leans, which she caresses, around which she moves.

However I wish to avoid any division between the concepts of embodiment and disembodiment with regard to present-day music machines and media technology, and insist therefore on including contemporary objects of technology as 'bodies'. Although their sound-producing means is no longer visible (a fact that began with the invention of the phonograph), the presence of computers, microphones and loudspeakers onstage as acting 'bodies' within a performance brings new possibilities to their roles. No longer placed at random around a performance space as functional objects to be semi-ignored — along with their operators — by the public, these media tools can assume a dramaturgical role in their aural/visual interaction with performers, this by a re-consideration of elements such as lighting, placement and inclusion as part of the stage set, as well as their integration with the actions of the performer. The computer and its main operator are essential to the dramaturgy of *Zaum: Beyond Mind* and placed onstage next to the bandoneon/instrumentalist. Both are effectively performers.

Likewise, in Aperghis's *Machinations* (2000), a computer-operator is seated onstage to one side of the four singers, attentively interacting with their vocal and gestural 'play'. Both audio and visual processing is made in real time, the former through microphones, the latter by means of cameras focussed on hands and objects. Here the audience witness a visible game occurring between a performer-manipulator and his mediated co-performers. By drawing attention to the physical, opaque quality of technology we are reminded of the very nature of this encounter: an interaction between human and machine bodies.

Turning from the 'body' of the machine or instrument to the 'machine' of the body, there are different levels on which this reversal occurs through a discourse

between the human being and media technology. With *Zaum: Beyond Mind* an extension of embodiment takes place in the electronic treatment of the 'wired' voice and bandoneon. The intrinsic qualities of both are re-formed, re-embodied into virtual voices/instruments, virtual machine-bodies that nevertheless retain something of the source in their re-fabrication and thus avoid a situation of alienation. I ground my argument for this interaction of the body with digital technology in the philosophy of post-humanism, a concept that stems from our increasingly close interaction with technology, and which concerns the dismantling of the liberal, autonomous humanist subject in favour of an emergent, multiple subjectivity (Hayles 1999).

In *Phonurgia* there is a moment near the end of the work when the performer, standing upstage with his back to the audience and playing his viola, becomes a mediator for the recorded string music originally take from a phonograph. For the audience and indeed for the performer, the combination of the two results in an experience of intermediality as if the body onstage had become a representation of the old machine playing its music. A further example of audio-visual disruption occurs in my concert-installation *PPPPPP*, where the choreography for the six pianists is deliberately reminiscent of early automata movements in their abrupt suspension or gradual deceleration. Recognisable images of hands and arms at the keyboard are gradually transformed by digital technology into undulating virtual body-parts in the video projection that runs parallel to the last few minutes of music and suspended gesture.

A temporal discourse between past and present, something which is common to all of the four works, takes place through a process of contextual re-constellation. The presence of old machines and instruments reaffirms a sense of memory, of a concrete historical past, in the audience-receptor. However in their radical juxtaposition with virtual technology in the form of digital film and sound recording or live, interactive electronics, they enter into a new terrain — a dialogue or 'play' both of, and through, time. Of course one could argue that this takes place in any concert involving, for example, harpsichord and electronic music. However this would be to ignore an important factor within the genre of sound theatre, namely the interaction between sonic and visual elements and their conscious application within the compositional process. It is here that embodiment plays a vital part in facilitating a temporal connection by shifting our attention constantly back and forth

between the material source and its virtual counterpart, whether on the level of sound or image or in their mutual exchange. Examples of this nature abound in each work, a case in point being the live toy musical box played by the performer on the wooden resonator of the harpsichord in *Interweave,* heard later in a sonic dialogue over two loudspeakers. Or the gramophone stylus crackling its way through a shellac disc and observed from close quarters by the surrounding audience in *Phonurgia*, echoed by its digital version that has been recorded and mixed to sound over quadraphonic speakers in multiple, manifold renditions of the locked groove. Live percussive or air sounds generated by the folding and unfolding of a bandoneon bellows in *Zaum: Beyond Mind* are witnessed on a visual level by the spectator/listener, only to be transformed into vastly-amplified timbres that resonate across the acoustic space at different speeds by means of live electronic processing.

Not least in this consideration of time and embodiment is the importance attached to a re-examination of what I would call the *archaeology* of music performance. It is for this reason that I focus in each work on the performative 'presence' (Lehmann 2006: 85) of each musician in relation to cultural and historical norms that have established themselves over time. In a process of re-exposure I attempt to isolate those facets that are deliberately hidden from standard concert or music theatre practice by re-introducing the presence of the body in its uniqueness and particular discourse with both instrument and sound, in short, with its performance environment. A parallel can be drawn here with Falk Hübner's *Thespian Play* (2008/2009), in which the gestures and expressions employed by the musician are isolated, allowing the audience to focus on his performing body. Every performer brings with them a personal history that is based on the integration of training with innate characteristics of personality. It is precisely this combination, together with a critical awareness of cultural practice over time that invites investigation on the performance stage. A true interaction of the body with instruments and machines of the past and present begins with an acknowledgement of its particularity, and leads to an integral performance that convinces an audience. In practical terms this means allowing room for the performer to recreate the compositional material of the score or to create the piece afresh with the composer/ theatre maker.

The final aspect that underlies my choice to work with both old and new technologies in discourse with each other is necessarily embedded in the other two issues and stems from a long-term interest in the archaeology of media (Zielinski 2006). Viewed from a contemporary aesthetic angle, old media tools provide us with the possibility of creating new contexts in their conjunction with the digital. Through a temporal shift they are re-examined as objects that have retained an innate materiality. This juxtaposition offers a contextual dialogue in which to examine the emergence of a new basis and its consequent re-inventions of meaning. The audible and visible working processes of early media machines, such as film projectors or gramophones, alert us to their undeniable physical presence alongside the resultant image or sound. Digital technology can also offer us forms of embodiment that are not manifested through sheer imitation of former technologies, but rather through extending and expanding our previous conceptions of the body. I argue here that the notion of a transformation and metamorphosis of the term becomes easier to understand in works that allow for a dialogue between both media forms. As a result of this lateral basis for interaction we dismiss any hierarchical debate based on disembodiment and embodiment.

Furthermore, a critical engagement with the means of technology offers in itself a context for cultural and historical reflection, replacing a tendency in contemporary forms of music theatre to resort to the subject matter of mythology as a reference point, a counterbalance, to the world of virtual medial. A re-formulation of the same thematic content familiar to us from 19$^{th}$ century opera, employed in conjunction with digital media, seems to me to deny the existence of new aesthetic possibilities that can be discovered by means of this technology. To paraphrase Chiel Kattenbelt, a re-assessment of media technology and machines — where present tools are far in advance of their aesthetic application — is needed in order to re-evaluate their use and re-invent new critical forms of inter-medial theatre-making. With reference to the acceleration of mass media technology, he indicates that the signification of its role and our experience in dealing with it are necessarily interwoven with each other (Kattenbelt 2010: 33).

Having addressed the question of embodiment in the light of a thematic content that runs through each of the works described, I now return to the afore-mentioned theoretical issues regarding its role in the creation, performance and reception of what is essentially a hybrid theatre-form. Featured chiefly among these is the

problem posed by disciplinary skills such as music that still remain, to a large extent, separately embedded in their aesthetic traditions. As indicated in my introduction, this division, not only within the creative and performing arts but also with regard to media technology and most importantly, between theory and practice, has inevitably retarded any understanding of the body in its relation to inscription and incorporation, to processes of learning and memory. No wonder then that many innovative attempts to cross these borderlines and investigate the possibility of acquiring relative skills that could offer a system of embodied dialogue between them, have met with such resistance. The results are clearly manifested in a tremendously under-developed potential of interaction between all of the above-mentioned elements that comprise a work of contemporary sound theatre. Faced with the task of processing a new work without resorting to a hierarchical disposition of roles, it is ultimately the degree and balance of skills in each person that will determine its lateral course.

My argument proposes the solution of an embodied approach to inter-disciplinary training (Bourdieu 1977, Ihde 2002), that begins with an experience of integrated arts and media technology as tools with which to explore new forms. Placing the body at the centre of this discourse offers the possibility of re-connecting threads that have been lost through over-specialization, bringing them into a lateral relationship of communication that extends knowledge through encounter. The learning process of embodied research undertaken during *Zaum: Beyond Mind*, where improvisation and experimentation played a key role in the development of the project, is a clear example of the above. A different perspective is illustrated by the reaction of performers to their installation environment in *PPPPPP*, where aspects such as light, suspended objects and moving image affect the body's sense of proprioception and re-sensitize its functionality in terms of the sound and movement generated in that shared space. A variation of this is offered by Rebecca Saunders and Sasha Waltz in *Insideout* (2003), where musicians are placed in different locations of a series of inter-connected, resonant rooms. Co-ordinated by means of a time-code, they hear, at the same time as their own, something of the others' music at a curious distance that is once-removed through lack of confirmation in the form of visual contact. Thus the ear becomes sharpened to its acoustic environment and enters into a relationship of call and response within the different degrees of proximity that are perceived.

There is a thematic link between the two theorists Bourdieu and Ihde, quoted earlier, and Frances Yates's description of historical forms of embodied learning in *The Art of Memory* (1966: 137), where she points to the use of images and signs as learning tools at the time of Giulio Camillo's *Memory Theatre* in 1554. The corporeal aspect of being surrounded by gestural inscriptions that covered the auditorium walls of this human-size model of a constructed wooden theatre, read from the perspective of the body placed *on stage*, was designed to open up the memory depths of the mind by means of space and location. Again, the body is placed at the centre, this time of a spatial architecture that acts as an external structural reference for the memory. A deliberate analogy is made here, on my part, between past and present perspectives on knowledge in order to compare their methodologies, examine what we can gain in doing so, and offer new light on our current situation.

Turning to the role of embodiment in inter-medial discourse and analytical procedures, my concern lies ultimately in re-evaluating our methods of acquiring knowledge — our epistemic tools — in a genre that has become more inter-disciplinary and mediatized. Referring to the question of meta-discourse posed by Nicholas Till and quoted in my introduction (2003), I would argue that this is indeed possible when based on an embodied understanding and awareness of the new social and cultural contexts in which work can be produced, thus refuting a traditional basis of individual autonomy in favour of creative exchange. A practical case in point would be the dialogue that took place with video artist Olalla Lemus during the creation of *PPPPPP*. Unhindered by language and aided by image, gesture, sound and a sensibility towards each other's work, the unknown space of encounter with another medium engendered an invention of new terms and a parallel 'text' that extended beyond any specialist knowledge of the respective discipline.

Furthermore, with regard to the question of terminologies and the solution of structural analogy proposed by Björn Heile (2006b), I would argue that this approach does facilitate communication between practitioners by generating a middle ground, in which a shift of relationship between the elements involved and their application, when seen from different perspectives, can be better understood. A key factor in any exchange of this kind lies in the ability to transfer between the sense modalities during processes of thinking by means of a fluid, contextual,

global approach that provides an inner horizon and accepts the pre-existence of unconscious knowledge (Bourdieu 1977). The above-mentioned solution was constantly applied in my collaboration with electronics composer Oded Ben-Tal during the research project described in chapter 2. Structural analogies were made between the programmed patches on a computer screen, musical material written in score form and textual/visual components. Terms were invented as tools to simplify the discourse, facilitating the entrance of either collaborator into the relatively unknown domain of the other and offering moments of experiential understanding. An example of this would be my increased sensibility to the responses of the Pd programme, incurred by both an aural and visual interaction with an electronic patch.

Throughout the previous chapters I have employed new terms in an attempt to broaden their definitions and offer a simultaneous perspective taken from media technology or theatre. Composites such as 'score-interface', 'object-bodies' or 'machine-body' lift any pre-conceptions associated with a particular word on to a different plane of encounter amongst practitioners and thus avoid the gulf of disembodiment through over-abstraction. New paradigms offered by collaboration between makers of theatre, music and media within this performing art provide a much-needed space for critique and reflection as to their aesthetic role. Given the very different creative circumstances under which new work can be made, due in large part to the technological tools available and the increasing combination of skills required by its practitioners, a pathway that offers a critical stance towards mediatization, by placing the body at the centre of aesthetic experience, is ripe for development.

Each of the four works that form the focus of my research offer solutions to notational problems arising from the incorporation of technology into a complex mechanism such as new music theatre, revealing different aspects of the score accordingly. Detailed consideration is given to the scenic structure of *Zaum: Beyond Mind*, within which each section is notated in open form, allowing space for live interaction with the electronics. Analyses of typical sonic results that occur in these moments of interaction, together with the insertion of pre-recorded material, are included at the end of the score. Incorporating elements taken from a process of devising, the score remains ultimately a documentation of intention for its co-author/performers and can be read as such by future collaborators from different

disciplines, such as a dramaturge or stage designer. Essentially it is a living 'intermediary' (Nattiez 1990: 79) that maintains its integral components despite the evolution of technology, and can be adapted according to new parameters that will be set in the future. My argument here is for a re-appraisal of transition in the face of new media technology, allowing for a continuous transformation of the work over time. It can 'thus maintain a longer life and have a broader impact culturally, because it is able […] to meet changing aesthetic values' (Garnett 2001: 27).

Another aspect, namely of the performer-body, is revealed in the scores of both *Phonurgia* and *Interweave.* Choices with regard to the personal performance history of the musician are placed at the centre of the musical material in the former work, both scores concerning themselves with a form of script/notation that makes room for the individual characteristics of live presence that each performer brings. Thus a bridge is constructed between the musical score and the live situation of a performance text (Lehmann 2006), details of choreography, lighting and a simple stage-set aiding the player in the creation of a personal narrative that guides him/her through the music. Moreover, in these works the score enters into its double function as a visible, deliberately-placed object within the stage space. Set on strategically-placed music stands throughout the performance space and on the table supporting both gramophone and instrument, it becomes a physical component marking geographical points on the stage 'map' of *Phonurgia.* An audience situated in the same vicinity as the musician observes and follows the relationship between player and score marked out in space and time. *Interweave* sees the presence of a large score whose pages are endlessly turned in contemplation by the player as she stands to one side of the instrument whilst her pre-recorded music issues from loudspeakers. An act that is divorced from a purely functional role allows us to focus on the shared gestures of a musician, at the same time drawing attention to the undisguised physicality of her performance materials.

Even more radical in their visual dimension are the score-objects that form part of the installation in *PPPPPP*. In a deliberate process of exteriorization I am exposing the materials inherent to a form of musical data that represents the score — piano rolls. The physicality of their presence is experienced in sheer volumes of perforated paper never normally seen by a public during performances of a player piano. In addition I connect the working-process involved in their original movement on a rotating cylinder to that of the actual notated scores used by each

performer. Attention is paid to choreographic and scenographic detail by means of drawings, diagrams and text, essential elements that are embedded within the score alongside the musical notation. As Nicholas Cook has pointed out, writing on notation and multi-media (1998: 268-270), the former is an embodiment of certain types of information according to existing cultural parameters including, by extension, digital recordings.

Viewed under the perspective of laboratory conditions, it seems necessary at this point to assess the results of each work's documented performance/production and re-examine the different stages of reflection involved in each case, thus contributing towards a valuable overall critique. A key factor in determining a successful end result is ultimately played by the role of time-space, a deliberate conjunction on my part that acknowledges the inseparability of these terms within the domain of practice as research. Works whose rehearsal period evolved over a relatively long duration of creative process, such as *Zaum: Beyond Mind*, proved to be more convincing in both content and performance, the degree of artistic development having allowed for an integration of ideas. Each work benefitted enormously from the effects of collaboration, discoveries having been made as a result of entering into the domain of another discipline, a step that encouraged both an extension and understanding of parallel skills. The degree of personal input on the part of the performers in rehearsal was decisive in determining the resultant material, a potential that remained however largely undeveloped within the limited time allocated to *PPPPPP*. In the case of *Interweave* intensive collaboration took place in the form of discussions between the performer and I prior to the rehearsal period. The performance context of each work was tested by the presence of an audience and the conditions of performance in all but one case. Difficulties were apparent in re-contextualizing a small auditorium to suit the designs of a staged concert performance within a programme of works whose emphasis lay chiefly on sonic material. In other cases the audience successfully shared the space with the performer(s), thus experiencing degrees of sonic/visual proximity and distance. A potential concert-installation, yet to be exposed to a live public, was reflected in the studio production of *PPPPPP*.

With regard to its *mise en scène*, each work underwent different processes that reflected in turn its afore-mentioned time-space allocation. The difficulty of incorporating too many elements of sound theatre into the process at one time

manifested itself most clearly in a rehearsal-workshop of *PPPPPP*, their separation and gradual integration within each consequent session proving the best course of events. A transferral of a static musical rehearsal situation to one of moving through stage and space became a moment of discovery for all of the performers. Multiple sensory perceptions were called into play as they measured musical time in terms of space. The eye was no longer adhering to a score and the ear allowing the body to sense its own extended, mediatized presence, as in *Phonurgia.* It became important to transform functional actions into dramatized ones, a goal that remained, however, unfinished in the resulting performances. Actions needed to become matrix-based, issuing from the performer's own motivation rather than seeming to be imposed. The development of a persona within each performer also showed an imbalance in each case, highlighting the difficulty of maintaining a shift of play in dramatic tension between movement and stillness. Each work reflected different stages of persona presence, ranging from a minimal existence to a more extended exploration. Persona-projection, in terms of embodying and communicating contrasting moods, met with varying degrees of success, the musician ultimately relying on his/her sense of their own actor-body in space. Likewise, challenges and resistances were encountered with regard to performer-audience engagement on the levels of gesture and eye-contact. Nevertheless, the most positive discovery made during rehearsals was the creative room for play allowed by improvisation in time and space. It offered the emergence of solutions to sonic-/motion-based problems during an experimental laboratory process. Non-adherence to a score in the early stages of *PPPPPP* opened up a new space of musical and gestural communication between the performers, a practice that became however more intimidating when applied to task-oriented movements such as unfurling the scrolls. Innovative techniques of both instrumental playing and object interaction were revealed in all cases. A spatial-temporal relationship to the sonic environment of a work was opened up, so that the performer no longer felt limited by the narrative demands of a score's time-frame.

To date only one of the works, *Zaum: Beyond Mind* has seen subsequent performances, each of which has evolved differently according to the conditions of both venue and context. However, turning to their development within the context of future performances, I shall outline some proposed strategies that should allow the ongoing, experimental nature of the material to ripen within ideal conditions.

These concern further collaborative measures that need to be taken, sonic/spatial pre-requisites for performance, structural extensions to the works themselves, and persona development within the performers. Essentially, my prime concern would be to work with a dramaturge/choreographer as co-collaborator during a rehearsal process in order to share the multiple tasks involved in realizing a work of sound theatre. The results would gain an added positive dimension with regard to each component of the theatre in its relation to the others, and benefit from the input of an outside eye and ear. Each work has its own optimal presentational environment that needs to be carefully considered in order to guarantee its future success. In general, a flexible exhibition/installation space without fixed seating allows for both sonic and spatial interaction between performers and public, with indications given to the audience (where necessary), prior to entering. The use of surround sound in each case highlights the importance of audience mobility within the performance's delineated parameters. A staged concert work such as *Interweave* demands a large auditorium and sufficient lighting equipment in order to effectively realize its intentions. Alternatively, as noted in the score, this work can also be 'installed' within a more flexible space through which the public moves.

Structural extensions to the original material have manifested themselves clearly in each subsequent performance of *Zaum: Beyond Mind.* Comprising a series of flexible modules that can be arranged in any order, the work has undergone something of a metamorphosis as new, lengthier combinations of sound, movement and image are invented. Together with the introduction of another medium — namely film — and a future project of creating not only sonic but visually interactive elements, the collaboration will involve a third person. In essence, the musical material of *PPPPPP*, *Phonurgia* and *Interweave* will remain relatively fixed in future performances, the performers then 'filling out' deliberate spaces that are left within the content of the score, such as the choice of recorded music in the second work. However if one of the components of the sound theatre proves to be redundant or demands re-evaluation, it will be altered.

Finally, the development of a persona within the performance presence of each musician will become an object of focus in subsequent presentations of these works. Ultimately it concerns a necessarily personal engagement on his/her part with all elements of the material, not only the music. For this reason I envisage working with performers who can bring this level of commitment to a rehearsal process and

contribute relative as well as specialist skills in the form of their own input. Challenges and limitations will be confronted and solutions provided by means of a cooperative team that comprises a dramaturge in its midst. By extension, my double role as performer/composer in one of the four works will remain open to direction from another collaborator, whether in the form of dramaturge, choreographer, co-performer or video artist.

Given the extent of my exploratory research over a period of three years, it is not surprising that a major shift has occurred within my own praxis as a composer/performer. Formerly adhering to the aesthetic paradigm of a completed work that was to be realized, I now consider these sound theatre works as performance-compositions that remain ongoing and subject to further laboratory process. Situated rather within the paradigm of performance, they are more akin to developments in theatre theory and practice as exemplified by Lehmann in his notions of text and the performative (2006). Their contextual nature deliberately allows room, both for the performer(s) and for the conditions of presentation. Indeed, each work should undergoes a transition or evolution with each subsequent performance, and acknowledge the identity of the team of people involved.

The reasons for my altered personal perspective are easy to discern throughout the whole thesis, as encounters with both experiential praxis and theoretical discourse are compared and evaluated. An overriding factor has been the need to situate my praxis within the philosophical framework offered by post-humanism with its altered concept of subjectivity. By extension this concern underlines an awareness of the cultural and historical conditions in which artistic work has evolved. On a contemporary note it seems relevant to provide the conditions for critique, reflection and the emergence of new aesthetic values to an audience on a more experiential level than has hitherto been the case. A work that communicates something of an aesthetic experience to an audience through the nature of its performance can have far-reaching effects. Likewise, artistic work that acknowledges the changeability of cultural contexts and aesthetic values is better able to enter into dialogue with its public.

Coupled with socio-cultural conditions of performance are those that are associated with the creative process itself. A radical shift of context within the working process, from one of autonomous isolation to exchange through collaboration, has left a profound impact on composers and theatre-makers. This

necessity is compounded not only by the very nature of the inter-disciplinary and inter-medial material itself, but also by the technological tools that are engaged. However, in contrast to some composers who still prefer to control all aspects of the process by engaging personally with each element, I lay enormous importance on the dialogue that can ensue from collective knowledge and input. This lateral approach to the creation of a work of sound theatre is one that I deem necessary if it is to have any real value in its future evolution within society.

It remains for me to summarize the findings of this research as a result of integrating both practical and theoretical approaches — the former with its emergent answers, the latter with its questions posed from the outside — as they have been illustrated in this chapter. Firstly it seems essential to place the body at the centre of discourse between music, theatre and media if we are to maintain contact with the physical world and avoid the disorientation of purely virtual experiences. The materiality of media tools, objects and musical instruments, perceived in their undisguised presence, can be re-invested by means of an aesthetic process that turns their former functional role 'inside-out'. In its interaction with technology and other media the complexity and multiplicity of the performer-body is thus acknowledged. Embodiment can be re-affirmed in our interaction with technology by means of epistemic tools and processes of analysis that recognise the historical and socio-cultural context of the body. This also applies to methods of discourse and collaboration between inter-disciplinary practitioners, involving the invention of terminologies that are drawn from experiential rather than abstract bases. Roles between authorship and realization can be delimited in order to enable the emergence of a new third ground that extends our concepts of subjectivity.

Finally, it seems vital to adopt a more fluid, transitional approach toward the score-script of a work of sound theatre, whereby it is conceived as a living entity — both organic and flexible — that can evolve within the context of each future performance.

# List of Figures

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## Chapter 2 — The Digital Instruments



## Chapter 3 — The Machine Era

## Chapter 4 — An Installation Environment



## Chapter 5 — Weaving the Soundscape



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## List of Scores

***Zaum: Beyond Mind*** (2008/10) sound theatre for voice, bandoneon, live/interactive electronics, choreography and lighting.

***Phonurgia*** (2009/10) music theatre for solo bowed string instrument, gramophone, voice, pre-recorded sound, choreography and lighting.

***PPPPPP*** (2009/10) concert installation for 6 pianists, piano rolls, choreography, lighting and film projection.

***Interweave*** (2011) Staged concert for solo harpsichord, musical box, pre-recorded sound, choreography and lighting.

## List of DVDs / CDs

***Zaum: Beyond Mind —***

CD: samples of Pd electronics and voice/bandoneon.

DVD: performance documentation, DRHA conference, Brunel University. 7.9.10. Performers: Caroline Wilkins, Oded Ben-Tal. Camera: Anne-Laure Misme.

***Phonurgia —***

CD: pre-recorded performance material.

DVD: performance documentation, Arnolfini, Bristol. 10.12.10. Performer: Phil Owen. Camera: Rhiannon Chaloner.

***PPPPPP —***

DVD: video film, performance material.

DVD: studio production, Drama Studio, Brunel University. 25.06.11. Performers: Piano Circus. Cameras: Olalla Lemus.

***Interweave —***

CD: pre-recorded performance material.

DVD: performance documentation, Music Building, University of Liverpool. 31.03.11. Performer: Jane Chapman. Camera: Michael Beiert.

# Bibliography


Aperghis, G. (2000), *Machinations,* [CD1], Wittener Tage für neue Kammermusik, 5-7 May, 2000, WDR 3, Cologne.

Bahr, H - D. (1982), 'Le Rossignol et le Robot', (trans. P. Galissaires) in *Travers* 26, pp. 127-133.

Barba, E. (1995), *The Paper Canoe*, London: Routledge.

---. (1997), *Whispering Winds,* [DVD], E. Barba (dir.),Odin Teatret Film & CTLS, Holstebro, Denmark.

Barthes, R. (1984), *Image, Music, Text*, (trans. Stephen Heath), London: Fontana.

Barthes, R. and Havas, R. (1991), *The Responsibility of Forms*: *Critical Essays on Music, Art and Representation,* (trans. R. Howard), Los Angeles: University of California Press.

Bauckholt, C. (2008), *hellhörig* [music score], Cologne: Thürmchenverlag.

Baumann, F. (2010), 'Interfaces in der Live-Performance' in Harenberg, M. and Weissberg, D. (eds.) *Klang (ohne) Körper: Spuren und Potenziale des Körpers in der elektronischen Musik,* [transcript] MedienAnalysen Band 5, Bielefeld: transcript Verlag. pp.75-90.

Becker, B. (1994), 'Körper und Komposition', unpublished text based on a discussion with Caroline Wilkins, University of Paderborn, Germany.

Beckett, S. (1998), *Krapp's Last Tape* [play], New York: Faber & Faber.

Bergson, H. (1911), 'Of the Survival of Images, Memory and Mind' in *Matter and Memory,* (trans. N. M. Paul and W. S. Palmer), London: George Allen and Unwin, pp. 169 –232.

Birringer, J. (2009), *Ukiyo / Moveable World* choreographic installation by Dans sans Joux, http://people.brunel.ac.uk/dap/ukiyo.html [Accessed: 06.07.11]

Bithell, D. (2007), *The Eye [unblinking]* - for six performers with computer controlled lighting, http://www.davidbithell.com/composition [Accessed: 06.07.11]

Boenisch, P. M. (2005), ‚Aesthetic Art to Aisthetic Act: Theatre, Media, Intermedial Performance', in F. Chapple and C. Kattenbelt (eds.), *Intermediality in Theatre and Performance,* Amsterdam: Rodopi Press, pp. 103-116.

Bourdieu, P. (1977), 'The Dialectics of Objectification and Embodiment' in *Outline of a Theory of Practice*, (trans. Richard Nice), Cambridge: Cambridge University Press, pp. 87-95.

Brandl-Risi, B. (2009), 'Still in Motion. Bewegung und Unterbrechung zwischen Performance, Bild und Musik', unpublished paper, conference reader, *Bewegung zwischen Hören und Sehen: Musik, Tanz, Theater, Performance und Film*, Symposium auf Schloss Thurnau, Bayreuth, 19-21 November, 2009, pp.18-19.

Brejzek, T. (2006), 'Physicality and Virtuality: Memory, Space and the Mediated Stage' in Oddey, A. and White, C. (eds.), *The Potentials of Space: the Theory and Practice of Scenography and Performance*, Bristol: Intellect Books, pp. 157-171.

Brown, E. (1952) *December* [music score], collection *Folio and Four Systems*, New York: Associated Music Publishers.

Cage, J. (1979), *Roaratorio. Ein Irischer Circus über Finnegan's Wake,* [CD], Ars Acustica, WER 6303-2, Mainz: Schott.

Caswell, Nick. (2010), 'Encountering Voice', unpublished paper, *Song, Stage & Screen V*, Conference on Interdisciplinary Approaches to Voice in Music, Theatre and Film, University of Winchester, UK, 3-5 September.

Certeau, M. de (1984), *The Practice of Everyday Life*, (trans. Steven Rendall), Berkeley: University of California Press.

Chion, M. (1983), *Guide des Objets Sonores*, Paris: Buchet / Chastel.

---. (1994), *Audio-Vision: Sound on Screen*, (trans. W. Murch and C. Gorbman), New York: Columbia University Press.

Ciciliani, M. (2009), *Corrosion* [multi-media work] for analogue synthesizer and laser reflections, http://www.markociciliani.de/archive/electronic_soundinstallations [Accessed: 06.07.11]

Cloot, J. (2009), ‚Klangtheater', *Neue Zeitschrift fuer Musik*, 4 (July/August), pp. 38-41.

Connor, S. (2000), *Dumbstruck: A Cultural History of Ventriloquism*, Oxford: Oxford University Press.

Cook, N. (1990), *Music, Imagination and Culture*, Oxford: Clarendon Press.

---. (1998), *Analysing Musical Multimedia*, Oxford: Oxford University Press.

Deleuze, G. (2003), *The Logic of Sensation*, (trans. D.W. Smith), London: Continuum.

---. (2005), *CINEMA 2, The Time-Image*, (trans. H. Tomlinson and R. Galeta), London: Continuum.

---. (2006), *The Fold: Leibniz and the Baroque*, 2nd edition, (trans. T. Conley), London: Continuum.

Deleuze, G. and Guattari, F. (1994), *What is Philosophy?* (trans. G. Burchell and H. Tomlinson), London: Verso.

---. (2004), *A Thousand Plateaus*, 5th edition, (trans. B. Massumi), London: Continuum.

DeMarinis, P. (1995), *The Edison Effect: A Listener's Companion,* [CD], Het Apollohuis / Apollo Records, ACD 039514, Netherlands.

Diderot, D. (1966), *Rameau's Nephew / D'Alembert's Dream,* (trans. J. Barzun and R. H. Bowen), London: Penguin.

Dixon, S. (2010), 'The Philosophy and Psychology of the Scenographic House in Multimedia Theatre', *International Journal of Performance Art & Digital Media*, 6: 1. pp. 7-24.

Duncan, M. (2004), 'The Operatic Scandal of the Singing Body: Voice, Presence, Performativity', *Cambridge Opera Journal*, 16: 3. pp. 283-306.

Duras, M. (1976), *India Song* [play], (trans. B. Brey), New York: Grove Press.

Eco, U. (1977),' Semiotics of Theatrical Performance', *Drama Review*, 21:1, pp. 107-117.

Edwards, B. (2003), *Xstasis* [DVD], Direction: B. Edwards, Twickenham: Optik Ltd.

Emmerson, S. (2007), *Living Electronic Music*, Kent: Ashgate.

Fischer-Lichte, E. (2003), 'Die Oper als "Prototyp des Theatralischen". Zur Reflexion des Aufführungsbegriffs in John Cages *Europeras 1 & 2',* in Danuser, H., Kassel, M. (eds.), *Musiktheater Heute*, Mainz: Schott, pp. 283-308.

Fontana, B. (1993), *Klangbrücke Köln / Kyoto* [CD 2], Ars Acustica WDR, LC 00846, WERGO, Mainz: Schott.

Forsythe, W. (1997), *Tight Roaring Circus*, [performance], Camden Roundhouse, London. Composer: Joel Ryan, Choreographers: Dana Caspersen and William Forsythe.
---. (2009), *Decreation*, [performance], Brooklyn Academy of Music, New York, Stage & Lighting Design: William Forsythe, Music: David Morrow.
Garnett, G. (2001), 'The Aesthetics of Interactive Computer Music', *Computer Music Journal*, 25:1, pp. 21-33.
Genette, R.D. (1988), *Métamorphoses du Récit*, Paris: Seuil (Poétique).
Giraud, A. (2001), *Pierrot Lunaire*, (trans. G. C. Richter), Truman State University Press.
Goebbels, H. (1998), *Max Black*, music theatre, www.heinergoebbels.com [Accessed: 06.07.11]
---. (2002a), ‚Schnitt: Frankfurt: Versuch über Hindemith' in W. Sandner (ed.), *Komposition als Inszenierung*, Frankfurt: Verlag der Autoren, pp.185-189.
---. (2002b), ‚Musik entziffern: Das Sample als Zeichen' in W. Sandner (ed.), *Komposition als Inszenierung*, Frankfurt: Verlag der Autoren, pp. 181-184.
---. (2002c), 'Text als Landschaft: Librettoqualität, auch wenn nicht gesungen wird' in W. Sandner (ed.), *Komposition als Inszenierung*, Frankfurt: Verlag der Autoren, pp. 64-70.
---. (2004), *Eraritjaritjaka*, musée des phrases, www.heinergoebbels.com [Accessed: 06.07.11]
---. (2008), *I went to the house but did not enter*, a staged concert in three plateaus [music score], Munich: G. Ricordi.
---. (2009), 'Gespräch über seine künstlerische Arbeit', unpublished paper, conference reader, *Bewegung zwischen Hören und Sehen: Musik, Tanz, Theater, Performance und Film*, Symposium auf Schloss Thurnau, Bayreuth, 19-21 November, pp. 24-25.
Hansen, M. B. N. (2004), *New Philosophy for New Media*, MA: MIT Press.
Harvey, J. (1999), 'The Metaphysics of Live Electronics', *Contemporary Music Review*, 18:3, pp.79-82.
Hayles, N. K. (1999), *How we became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics.* Chicago*:* Chicago University Press.
Heile, B. (2006a), *The Music of Mauricio Kagel*, Kent: Ashgate.
---. (2006b), 'Recent Approaches to Experimental Music Theatre and Contemporary Opera', *Music and Letters*, 87: 1. pp. 72-81.
Hess, F. (2001), *Light as Air* [catalogue], B. Schulz (ed.), Heidelberg: Kehrer Verlag.
Huber, K. (2003), 'Werkgespräch: Klaus Hubers Oper *Schwarzerde*. Der Komponist im Gespräch mit Anton Haefeli' in Danuser, H. and Kassel, M. (eds.), *Musiktheater heute*, Mainz: Schott, pp. 377-394.
Hübner, F. (2010), 'Thespian Play: Synchronous Differences' in Bay-Cheng, S., Kattenbelt, C., Lavender, A., Nelson, R., (eds.) *Mapping Intermediality in Performance*, Amsterdam: Amsterdam University Press, pp. 143-148.
Hulkko, P. (2010), 'Bodies Speak – Words Move', *The Embodiment of Authority: Perspectives on Performances*, International Conference on Performing Arts, Sibelius Academy, Helsinki, Finland, 10-12 September. http://www.embodimentofauthority.net [Accessed 15.12.11]

Hutchins, E. (1995) *Cognition in the Wild*, Cambridge: MIT Press.
Hüttenbrink, S. (2009), *Itinerrance*, Paris: L'Harmattan (Levée d'Ancre).

Ihde, D. (2002), *Bodies in Technology*, Minnesota: University of Minnesota Press.
Jentzsch, C. (2004), 'Die Songline in Canettis Denken', *Heiner Goebbels*. http://www.heinergoebbels.com/en/archive/texts/articles/read/119 [Accessed: 02.03.11]
Kagel, M. (1972), *Exotica* [music score] for non-European instruments, London: Universal Edition.
Katschthaler, K. (2010), 'Kurtág on Stage? Between Pure Music and Latent Musical Theatre', unpublished paper, conference reader, *Music on Stage 3rd International Conference*, Rose Bruford College, Kent, UK, 23 -24 October.
http://werkstatt.unideb.hu/de/aktuelleausgabe.htm [Accessed: 30.10.10]
Kattenbelt, C. (2010), 'Intermediality in Performance and as a Mode of Performativity' in Bay-Cheng, S., Kattenbelt, C., Lavender, A., Nelson, R., (eds.) *Mapping Intermediality in Performance*, Amsterdam: Amsterdam University Press, pp.29-37.
Kelly, C. (2009), *Cracked Media: The Sound of Malfunction*, Cambridge, Mass: MIT Press.
Kim, J. H. (2010), 'Embodiment musikalischer Praxis und Medialität des Musikinstrumentes – unter besonderer Berücksichtigung digitaler interaktiver Musikperformances' in Harenberg, M. and Weissberg, D. (eds.) *Klang (ohne) Körper: Spuren und Potenziale des Körpers in der elektronischen Musik*, [transcript] MedienAnalysen Band 5, Bielefeld: transcript Verlag. pp.105-118.
Kirby, M. and V.N. (1986), *Futurist Performance*, New York: PAJ Publications.
Kircher, A. (1673), *Phonurgia nova sive Conjugium mechanico-physicum artis et naturae paranympha phonosophia concinnatum*, Campidona (Kempten): Rudolph Dreher.
Klein, J. (2008), 'Voice and Live Electronics: An Historical Perspective'. *Live and Interactive Electronic Vocal Compositions: Trends and Techniques for the Art of Performance*, Doctoral thesis, McGill University, Montréal January 2007. http://cec.concordia.ca/econtact/10_4/klein_livevoice.html [Accessed 05.11. 09]
Krunchonyck, A. (1996), 'Zaum in Tiflis 1917-1921', in *The Transrational Poetry of Russian Futurism*, (trans. G. Janacek), [online], San Diego: State University Press. http://www.thing.net/~grsit/l&d/krucht1.htm [Accessed 11.07.11]
Kurtág, G. (1985-86), *Kafka Fragments* op. 24, [music score], Budapest: Editio Musica.
LaBelle, B. (2006), *Background Noise*, New York: Continuum Books.
Lachenmann, H. (1996), *Über das Komponieren: Musik als Existentielle Erfahrung. Schriften 1966-1995*, Frankfurt: Insel Verlag, p.79.
Lecoq, J. (2000), *The Moving Body*, London: Methuen.
Lepage, R. (2007), *Le Projet Andersen*, [+DVD], Québec: Éditions L'instant scène.
Lehmann, H.T. (2006), *Postdramatic Theatre*, (trans. K. Jürs-Munby), London: Taylor & Francis.
Le Roy, X. (2006), *Mouvements pour Lachenmann*, performance of *Salut für Caldwell* (1977), guitar duo by Lachenmann choreographed by Le Roy, 'Musique du Geste', Agora Festival, Centre Pompidou, Paris. http://www.festival-automne.com/more-mouvements-f-r-lachenmann-spectacle203.html [Accessed: 01.08.11]
---. (2007), *Le Sacre du Printemps*, Performance and concept: Le Roy. Music: Stravinsky. Recording: Berlin Philharmonic, cond. S. Rattle. http://www.xavierleroy.com/page.php?sp=a0f7e349ea6cabcd6b97cfb20f2582d9c062cba9&lg=en [Accessed: 01.08.11]

Lissa, Z. (1969), 'Stille und Pause in der Musik', in *Aufsätze zur Musikästhetik, Eine Auswahl*, Berlin: Henschel, pp. 157-183.
McClary, S. (1991), 'This is not a Story my People tell: Musical Time and Space according to Laurie Anderson' in *Feminine Endings: Music, Gender and Sexuality*, Minnesota: University of Minnesota Press, pp. 132-147.
Merleau-Ponty, M. (1964), 'Eye and Mind', (trans. C. Dallery), in James Edie (ed.), *The Primacy of Perception*, Evanston: Northwestern University Press.
---. (2003), *Phenomenology of Perception*, 2nd Edition, (trans. P. Kegan), London: Routledge.
---. (2004), 'The Intertwining – The Chiasm' in T. Baldwin (ed.), *Maurice Merleau-Ponty: Basic Writings*, (trans. A. Lingis), London: Routledge.
Müller, H. (1993), 'Germany's Identity Crisis,' *New Perspectives Quarterly*, 10: 1. pp. 16-19.
Nancarrow, C. (1998), *Collected Studies for Player Piano*, [music score], Frankfurt: Schott.
Nancy, J. - L. (2007), *Listening*, (trans. C. Mandell), Stanford: Stanford University Press.
Nattiez, J. - J. (1990), *Music and Discourse: Towards a Semiology of Music*, (trans. Carolyn Abbate), Princeton, New Jersey: Princeton University Press.
Oddey, A. and White, C. (2006), 'Introduction: The Potentials of Space', in Oddey, A. and White, C. (eds.), *The Potentials of Space: the Theory and Practice of Scenography and Performance*, Bristol: Intellect Books, pp.11-24.
Parsons, M. (1969), *Walk* [music score], Experimental Music Catalogue. http://www.experimentalmusic.com.uk [Accessed: 02.08.11]
Pluta, I. (2010), 'Robert Lepage and Ex Machina: *The Andersen Project* (2005)', in Bay-Cheng, S., Kattenbelt, C., Lavender, A., Nelson, R., (eds.), *Mapping Intermediality in Performance*, Amsterdam: Amsterdam University Press, pp. 191-197.
Richards, J. (2008), 'Getting the Hands Dirty', *Leonardo Music Journal*, 18:1, pp. 25-31.
Riches, M. (2004), *The Machines* [catalogue], Odense, Denmark: Kunsthallen Brandts Klaedefabrik.
Roesner, D. (2005), ‚Musikalische Spiel-Räume' in Roesner, D.,Wartemann, G. and Wortmann, V. (eds.), S*zenische Orte, Mediale Räume*, Hildesheim: Georg Olms, pp.129-147.
---. (2008), 'The Politics of the Polyphony of Performance: Musicalization in Contemporary German theatre'.
https://eric.exeter.ac.uk/repository/bitstream/handle [Accessed: 05.07.11]
Rzewski, F. (2009), 'Über Mauricio Kagels „Pandora's Box, Bandoneonpiece"', *MusikTexte: Zeitschrift für Neue Musik*, 120, February, pp. 65-72.
Salzman, A. von. (1913), 'Licht, Belichtung und Beleuchtung', in *Das Claudel-Programmbuch*, Hellerau, p.89.
Salzman, E. and Desi, T. (2008), *The New Music Theatre: Hearing the Body, Seeing the Voice*, New York: Oxford University Press.
Satz, A. (2010), 'Music of its Own Accord', *Leonardo Music Journal*, 20, pp. 73-78.
Saunders, R. (2003), *Insideout*, [music score] for Ensemble Musikfabrik in collaboration with Sasha Waltz (choreography), Frankfurt: C. F. Peters.
Schlichting, H.B. (2002), 'Heiner Goebbels in Hörweite' in W. Sandner (ed.), *Komposition als Inszenierung*, Frankfurt: Verlag der Autoren, pp. 71-83.

Schoening, K. (1997), *Klangreise*, Cologne: WDR Verlag.
Small, C. (1998), *Musicking: The Meanings of Performing and Listening*, Middletown: Wesleyan University Press.
Stricker, A. (2003),'Interferenzen bildkuenstlerischer und textueller Verfahren' in Roesner, D., Wartemann, G., Wortmann, V. (eds.), *Szenische Orte, Mediale Räume*, Hildesheim: Georg Olms, pp. 239-259.
Strindberg, A. (2000), [play], *Gespenstersonate*, M. Kusej (dir.), Thalia Theatre, Hamburg.
Till, N. (2002), 'Manifesto: I don't mind if something's operatic as long as it's not opera', *Post-Operative Productions: A Critical Practice.*
www.post-operative.org/manif2.html [Accessed 09.06.09]
---. (2003), 'It's good for you, the virtue of virtuosity', *e-PAI, Virtuosity and Performance Mastery* [online], issue 2003/4.
http://www.sfmelrose.uk/e-pai-2003-04 [Accessed 01.07.11]
Toop, D. (2004), *Haunted Weather: Music, Silence and Memory*, Chatham: G.B. Mackays.
Vear, C. (2009), *Sound Theatre*, unpublished paper, T@PRA (Theatre & Performance Research Association) Conference, University of Plymouth, UK, 7-9 September.
Verstraete, P. (2009), *The Frequency of Imagination: Auditory Distress and Aurality in Contemporary Music Theatre*, University of Amsterdam, unpublished Ph.D. thesis.
Wahlford, L. (2010), 'The Pianist as an Embodied Subject-in-Progress', *The Embodiment of Authority: Perspectives on Performances*, International Conference on Performing Arts, Sibelius Academy, Helsinki, Finland, 10-12 September. http://www.embodimentofauthority.net [Accessed 15.12.11]
Wiens, B. (2010), 'Modular Settings and Creative Light: The Legacy of Adolphe Appia in the Digital Age', *International Journal of Performance Art & Digital Media*, 6: 1. pp. 25-39.
Wilkins, C. (1994), *Theatri Machinarum*
---. (1999), *Mecanica Natura*
---. (2002), *Le Fisarmoniche*
[radio-phonic works], production: Studio Akustiche Kunst, Cologne: WDR 3.
---. (2003), 'Musica Automata: Machines and Bodies', *Leonardo Music Journal*, 36: 2, p. 104.
Wilson, R. and Kuhn, H.P. (1996), *H.G.* [DVD], Exeter Digital Archives, D026. http://spa.exeter.ac.uk/drama/research/exeterdigital [Accessed: 06.07.11]
Winkler, T. (1998), *Composing Interactive Music: Techniques and Ideas using Max*, London: MIT Press.
Yates, F.A. (1966), *The Art of Memory*, London: Routledge and Kegan.
Zielinski, S. (2006), *Deep Time of the Media*, Massachusetts: MIT Press.