The Evolving Loci of New Music

Student: Paul Simon Limbrick

Student Number: 00468753

A thesis submitted to Middlesex University in partial fulfilment of the requirements for the degree of PhD

School of Arts and Creative Industries

Submitted : September 2021

Abstract

This thesis argues that the nature of the performance of new music has evolved. Its arguments and evidence are taken from case-studies, presented by a performer, that reflect on recent and historical practices. The focus of the research is on the development of performance practices in contemporary music over recent decades, following the innovations of composers such as Stockhausen, Boulez and Xenakis since the 1950s, particularly in the field of writing for percussion. It acknowledges that musical performance has many dimensions and is determined by a complex configuration of conditions and factors such as musical materials, local and geographical physical location, cultural context and technologies. These dimensions offer perspectives for understanding the multivalent site of music performance, as a configuration of practical and theoretical ideas grouped under the headings *practice, technology* and *community.* This thesis proposes the notion of the *locus of performance* generated by a set of such conditions. My experiences as a performer are the basis for an auto-ethnographic methodology and central to the articulation of this notion. My creative work contributes to a model of practice-based research, and establishes my perspective as the performer, able to witness how the *locus of performance* has evolved. The roles of the composer, performer and audience, and their identity and presence in the musical performance, are considered in relation to factors such as new musical practices, technologies and communities. The relationship between these contributing factors is considered in an attempt to create a model of musical performance. The critical perspectives gained from this process will contribute to an evolved notion of the loci for new music.

Acknowledgements

There are many people to thank for their support of my journey through the period of this research. I would like to thank Middlesex University for giving me the opportunity to carry out practice-based research within context of new music performance. The Postgraduate support team at Middlesex University, London, has always been available for advice and support, for which I am very grateful. The initial research support programme provided technical and informative guidance that gave me confidence and a sound basis on which to start the work. There have been many opportunities to explore a pathway through the practical and theoretical aspects of the work, including the discussion groups and performance seminars. I would like to thank my supervisory team, Vida Midgelow, Jonathan Impett and Ben Dwyer for supporting the many performative discussions, presentations and workshops at the university. I would like to thank Jonathan Impett for helping me to understand and express my thinking, and innumerable suggestions for related texts and practices. I have to thank the technicians and studio staff for their unerring and positive support at presentations and workshops.

There are many performers, composers and participants who have contributed musical materials and ideas for my performances, especially those with whom I worked closely: Ed Kelly, Gregory White, Ruta Vitkauskaite, Angus Stewart, James Carpenter, Lee Westwood, Bret Battey, Vic Hoyland, Jonty Harrison, Dominic Muldowney, and Jeremy Clay. Also those people with whom I have worked on large mixed-media projects that are featured in this research, including film and site-specific pieces; Harry de Wit, Emily Richardson and Rosemary Lee. I have to thank Dave Morgan for assistance with the website production and the patience to understand the experimental nature of my ideas for the Internet-based materials. I would also like to thank the many performance artists I have come into contact with who have offered comments, seemingly small suggestions that have directed me to some unknown and entirely relevant territory. I would also like to thank members of my family for listening and their sound advice.

Contents

5 EVOLVED PRACTICE

Media

Many of the case-studies have audio or visual files, there are also links to media stored on remote internet sites and my website. Large video files are located on links to Youtube or Vimeo. These are all accessible through the links provided. There is a choice. This symbol means the file can be located in the Appendices at the back of this thesis. There are also links using the https format, or the QR code, which is possible with a Smartphone – in a Wifi zone, point the camera at the QR code until it registers and then it goes to the address. Often it will just play immediately.

Title Composer QR Code

Skin **Gregory White**

Track 3, 6 and 7 /Appendix 1

https://soundcloud.com/simon-limbrick/3-skin-doubled-composed-greg-white

Island of Silhouettes **Ruta Vitkauskaite**

Track 2 /Appendix 1

https://soundcloud.com/simon-limbrick/2-islands-of-silhouettes-composed-ruta-vitkauskaite

Algo Vibes **Angus Stewart**

Track 1 and 8 /Appendix 1

https://soundcloud.com/simon-limbrick/1-algovibes-composed-angus-stewart

Points **Simon Limbrick**

Track 4, 5, 6 / Appendix 1

https://soundcloud.com/simon-limbrick/4-pointsa-composed-simon

A First Show **Dominic Muldowney**
Video extract
Track 9 / Appendix 1 **https://youtu.be/Gy91-TUZdZ4**

Abstract 28X **https://youtu.be/5fGlPKfUKqI**

Abstract 29X **https://youtu.be/v5NnXdMpjBA**

Abstract 30X **https://youtu.be/KImhF979Wlo**

Abstract 31X **https://youtu.be/gOK8ouSxUEI**

Rimshot **https://youtu.be/krbiiYC6Tmg**

Shekere **https://youtu.be/fqRtudyCHAc**

'dot-machine' **http://www.marimbo.com/dot-machine/**

'CriticalWaves/ResonanceFM'

https://soundcloud.com/criticalwavesradio/simon-limbrick

Short film 3 Church walk (Dir. Emily Richardson)

https://vimeo.com/140206288

(Full film distributed by LUX www.lux.org.uk)

1 Introduction

Since about 1950 – the 'degree zero' of the new music (Boulez and Deliège, 1976, p.5) – the position of the performer of new music has evolved rapidly. Informed by changes in technical, cultural and theoretical practices, the performance of new music has developed along new and sometimes incongruous dimensions.

Earlier cultural conventions as to the nature of art music performance have been challenged explicitly and implicitly. Such assumptions include: the identity, autonomy and authorship of the work, and the work concept itself; the status of a musical object as text, concept or experience; the degree to which a performer is an 'interpreter'; the importance of technique and virtuosity; the relationship of performance/performer with an audience; the nature of 'liveness'; the unities of time and place. Of course such conventions are arguable even in the most tradition-bound of cases, but in general terms they can still be said to hold for the early monuments of the 'new music' – the works of Stockhausen, Boulez, Ligeti or Xenakis, for example. These works have been produced in a transformed cultural environment, characterised by technological development of the dynamics and context of performance.

From a performer's perspective, such dimensions might be considered as questions of location: the 'where' of new music performance. This thesis will consider the location of such performance from several perspectives – parameters that have evolved significantly over recent decades. None uniquely determines the location of the music event in its entirety, of course. We therefore adopt the more abstract notion of 'locus' – here understood by analogy with its mathematical sense:

The curve or other figure composed of all the points that satisfy a particular equation or are generated by a point, line, or surface moving in accordance with defined conditions. (Shorter Oxford Dictionary, Sixth edition).

The conditions determining the experience that is a particular musical performance are of many kinds. The research is directed by my practical work, in case-studies that

expose changes in these conditions and the relationships between them. There are case-studies focussed on works produced during the period of this research (2013-2019), and others taken from my historical portfolio of works. These works figure as key moments when I have been challenged by a changing environment for performance. The performer's perspective is crucial here and my performance practice forms a key part of the methodology for the research. Evidence from the practice and ideas from theoretical texts have formed the basis for an auto-ethnographical methodology used to investigate and articulate the argument that the locus for the new music has evolved.

Each case-study provides a different view of the locus, and a significant area in which the creation and performance of new music has developed away from previous concert-giving conventions, affording new possibilities and raising new questions. The locus is naturally an aggregate of conditions - intentional and circumstantial, conscious and otherwise – and rarely determined by a single property of the work. However, it is hoped that by examining each of my projects through the lens of one of these major axes of change, a clearer sense will emerge of the evolving locus of the performance of new music. Much has been written from the point of view of the various contributing fields of research, theory and development: technology, philosophy and aesthetics, compositional theory, cultural and media studies. As the performer at the centre of this research, I am able to access the knowledge and experiences that condition and enable performative action, in conjunction with these contributing texts. The locus is manifest in the action of performance.

1.1 Complex nature

Here, I give an initial view of ideas that surface and the complexities involved in attempting to investigate and critique the nature of the performative locus. The investigation and reasoning is driven by the production of musical works, in a context informed by practical disciplines and theory. Marvin Carlson describes the nature of this theory as a 'complex body of writing about performance, attempting to analyze and understand just what sort of activity it is' (Carlson, 2004, p.1). He suggests that the production of musical works is informed by 'a wide range of disciplines, and such a complex web of specialised critical vocabulary' (ibid., p.1). The performer operates in this

context, making a performance that can be understood as emergent; it opens out to a world that it creates for itself, as a result of the conditions that formed it.

As the performer who contributes to the construction of this locus, I have looked for ways to challenge its complex nature and establish an investigation of these conditions. The *where* of performance is contradictory and problematic as a place for empirical clarity and theoretical consistency, with performance as an 'essentially contested concept'. [1] The possibility of rival uses or interpretations of it does not run counter to the understanding of its boundaries, as the presence of the performer remains a constant. The nature of that presence is an important topic for understanding the dynamic of the locus. This thesis will propose and explore a contemporary concept of *locus* in performance, by considering a series of case-studies from my own creative work.

1.2 Performer's viewpoint

The performer's perspective is a key component of the research, so it is useful to give a sense of my presence within the performative environment. As a musician, composer and educator, performance is a fundamental component of my musical activity. With over forty years of experience and continuing to engage with a wide range of performance practices in contemporary art music, I have access to a range of perspectives on the basis of which to investigate developments that inform the performative locus. Working in these different areas has often led me to rethink my position regarding the processes and relationship of performance practice to its component materials, audience and location. This background has afforded many opportunities to challenge and reassess the development of the concepts that locate the performance of new music.

[1] 'Recognition of a given concept as essentially contested implies recognition of rival uses of it (such as oneself repudiates) as not only logically possible and humanly 'likely', but as of permanent potential critical value to one's own use or interpretation of the concept in question...certain concepts, such as art and democracy, had a disagreement about their essence built into the concept itself.' From *Philosophy and the Historical Understanding* (Gallie, 1964, p.187)

The following outline of my experience serves to contextualise my musical activities within the broader scope of my career. It also points to some of the ideas that later develop as threads through my research, connecting to ideas in the case-studies .

1.3 Performer profile

The following is a short profile of my position in relation to the performance of new music.

As a musician, I am active as a composer and percussionist , and have contributed to a wide range of musical contexts throughout Europe and further afield, including Australia, India, Japan and the Americas. As well as more 'mainstream' musical activities, such as working in theatres, orchestras and popular music contexts, these activities have included world premieres of solo and chamber works by internationally renowned composers, working with specialist music ensembles and with artists of non-European musical cultures. I continue to work as a commissioned composer of music for concerts, dance, film and mixed-media. My experience in educative practices includes leadership in full-time Secondary Education, Higher Education and Community Arts projects. Alongside this collection of skills and instruments is a facility with music technology that includes software programming, instrument design and sound production. I would suggest that such a hybrid portfolio of skills and activities has become necessary for the contemporary professional musician, as they navigate a complex and fragmented cultural-economic landscape.

It is useful to set out some definitions used in this writing. The use of the term 'performance' has already exposed a tendency towards it taking on different meanings, depending on the context. In order to have some clarity in the writing, the use of the following terms will be as consistent as possible, without losing any opportunity to enrich a discourse through some useful adaptation, as will be discussed in the course of the text. Their use inevitably reflects the plastic nature of the concept of the *locus of performance* developed in an atmosphere where 'performance has become just such a concept, developed in an atmosphere of *sophisticated disagreement* by participants who 'do not expect to defeat or silence opposing positions, but rather through continuing dialogue to attain a sharper articulation of all positions and therefore a fuller understanding of the

conceptual richness of performance' (Mary Strine, Beverly Long, Mary Hopkin,1990, *in* Carlson, 2004, p.1).

1.4 Definitions

As this thesis will engage with ideas from a range of different technical, aesthetic and theoretical disciplines, certain terms will assume a range of functions. To establish how the terms that follow are used throughout this text, and because they have acquired so many variants in their meaning, the conventional usage from the Oxford Dictionary is given, alongside any modified version taken from theoretical works by authors that I have called upon in the course of discussion. Differences between them can also throw some light on the nature of the context.

As this thesis deals specifically with a new understanding of the location of new music performance practice, the terms *performance* and *performative* appear frequently throughout the text. *Performance* is used in its conventional sense as, 'The action of performing a play, piece of music, ceremony, etc.; execution, interpretation' (OED, 2017), and also in a modified sense as part of the more abstract concept of locus loosely determined by conceptual parameters.

Performative is used in the conventional sense as, 'Of or relating to performance'. This use extends to anything that can be considered as possible for the act of performance. So, this includes solid objects, spaces, buildings, etc as well as more common entities like texts, scores, sounds.[2]

It is worth noting how the conventional definition of *performance space* differs from the abstract *locu*s used in this thesis. Its main purpose is to define the place of performative action as a physical location dedicated to the purpose of performance. This location is still subject to the influence of factors beyond the immediate performance.

2 'Performance is no longer easy to define or locate: the concept and structure has spread all over the place. It is ethnic and intercultural, historical and ahistorical, aesthetic and ritual, sociological and political. Performance is a mode of behaviour, an approach to experience; it is play, sport, aesthetics, popular entertainments, experimental theatre, and more' from General Introduction to the Performing Arts Publication Series (McNamara and Schechner) and quoted in Critical Concepts in Literary and Cultural Studies vol. 1.(Auslander, 2005, p.215)

Kelleher and Ridout observe that the experience of the audience in a performance 'is marked by its location, be that geographical, cultural or social' (Kelleher and Ridout, 2006, p.2).

The immediate physical environment of performance can be especially constructed for that purpose. This is the conventional use of *architecture***.** *Architecture* is also used in this thesis to refer to spaces that have been adopted for the purpose of performance, whether natural, like a cave, or man-made, like a disused warehouse.

In this text, the term *community* is used to define a type relationship between a number of people rather than the conventional meaning of them being in the same location. The sense is of them being collected together – however temporarily, however geographically dispersed - because of similar or shared interests. Contemporary media and technologies have clearly played a major role in the evolution of our perception of community.

Technology is used in its modern sense, particularly regarding music, computer and internet technologies: 'The application of such knowledge for practical purposes, esp. in industry, manufacturing, etc.; the sphere of activity concerned with this; the mechanical arts and applied sciences collectively'(OED, 2017). This term also refers to the actual apparatus of music performance and the context in which it finds itself; the location in which musical performance takes place both as physical or ' virtual' (see definition below) site. The idea proposed here is that materials - whether physical, electronic, or even light - and the organisation through the use of technological knowledge, know-how, a technological process, method, or technique, constitute a technology that contributes to the identity of the locus.

The term, *cyberspace* is understood in this text in terms of the definition proposed by Bernard Stiegler. '*Virtual spaces*, a metaphor that can conceal the real dynamics of the process at work here...are the sum total of retentional data, physically retained on/in digital supports that are inaccessible without the mediation of a representational mechanism for their information, constructing an intuitive image using interfaces to represent and render these *unreadable* material states manipulable by a nonprofessional consciousness - and this is not in any case a matter of 'immateriality', a concept that is

frequently bandied about and that means absolutely nothing' (Stiegler, 2011, p.136). The current dictionary definition is, 'The space of virtual reality; the notional environment within which electronic communication (esp. via the Internet) occurs'(OED, 2017). Stiegler provides detail that prevents the components of an electronic system being understood as something without its physical presence, without materiality. The differences in the definitions make for an interesting review, as the dictionary definition is commonly used to refer to 'virtual reality'.

The term *media* is difficult to define in any single usage, as it has evolved from a plural form of medium, something that communicates between positions, to a singular form that has different meanings according to its context. The dictionary gives 'The main means of mass communication, newspapers, radio, and television, regarded collectively; the reporters, journalists, etc., working for organizations engaged in such communication. Also; a particular means of mass communication' (OED, 2017).

This needs to include its use to refer to the conduits and apparatus of cyber-communications, including the Internet and computer tools, physical transfer and storage technologies, and the communicative realms of social media.

It is also worth noting definitions that address cultural and social uses of 'media'. An understanding of how the components and usage of media has evolved into a technologically enabled social environment is one of the main dimensions of this research. Key ideas, developed later in the case-studies, are touched upon here. Interpretations such as when it 'names an ontological condition of humanization- the constitutive operation of exteriorization and invention'(Mitchell and Hansen, 2010, p.7) and 'can no longer be dismissed as neutral or transparent, subordinate or merely supplemental to the information they convey' (ibid., 2010, p.1). McLuhan's identification of 'media' as a component and extension of human interaction is also relevant (McLuhan, 2010, p.9). The following reference to 'media', that 'they do not remain static, but constitute a dynamic, historically evolving environment ' (Mitchell and Hansen, 2010, p.7) also serves as a useful view on the performance locus.

The term *liveness* has come to represent a body of research and investigation into the changing conditions of what constitutes live presence in performative contexts.

Research investigates the effects of mediation and modern communication on the evolved experiences of presence and live action, with extensive texts by Auslander, Sanden, Stone *et al*. (Auslander, 2008)(Sanden, 2013b)(Stone, 2015). Auslander argues against the common assumption 'that the live event is *real* and that mediated events are secondary' and proposes that 'liveness must be examined not as a global, undifferentiated phenomenon but within specific cultural and social contexts.' The conventional definition is still with a sense of liveness as *real*, 'The quality or condition (of an event, performance, etc.) of being heard, watched, or broadcast at the time of occurrence.'

1.5 Towards a methodology

The practical context for this research means that any critical approach needs to be possible in the midst of the actions of creating performance. The actions take place in the studios, concert halls and other performance sites that characterise an evolved performance practice. These spaces are also where decisions are made and discussions are held, in relation to the score-text, the practical work and with other participants. In order to find useful critical tools in the midst of the practical work, an approach was adopted that allowed for questioning, challenging, testing, documenting, reviewing, writing and the integration of critical viewpoints. Scoping the literature of performance theory and practice initially supported the research, with a search for frequent and useful terms, and a theoretical structure. My experiences provide the data for the research, with a qualitative methodology that is defined as auto-ethnographic, 'where the researcher is the subject and the researcher's experiences are the data' (Ellis et al., 2011, p.1).

The text for the thesis is set out to reflect a methodology that was developed to identify relationships between three groupings of ideas and terms. The following list sets out these texts and their groupings. Below the list is a diagram (Fig 1.1) which illustrates how terms and ideas can be placed in relation to each other. The placement is based on qualitative assessments and the coincidence between the fields is understood as dispersal of related ideas. The diagram is not fully populated at this stage, as it will be used later in Chapter 3, to articulate the introduction of new data. The titles of the groupings are used to indicate the focus of the research in relevant chapters, as *Practice, Technology* and *Community.* A detailed explanation of the methodologies applied in the research is the focus of Chapter 3.

1.5.1 Headings

Practice

- The body, actions and presence of the performer
- The nature of identity in the musical work
- The musical object as text, concept or experience
- Performer as 'interpreter'
- Technique and virtuosity

Technology

- Musical resources and technologies
- Interface
- Mediation
- Communication

Community

- Relationship between performance, performer and audience
- The nature of 'liveness'
- Temporal and spatial components

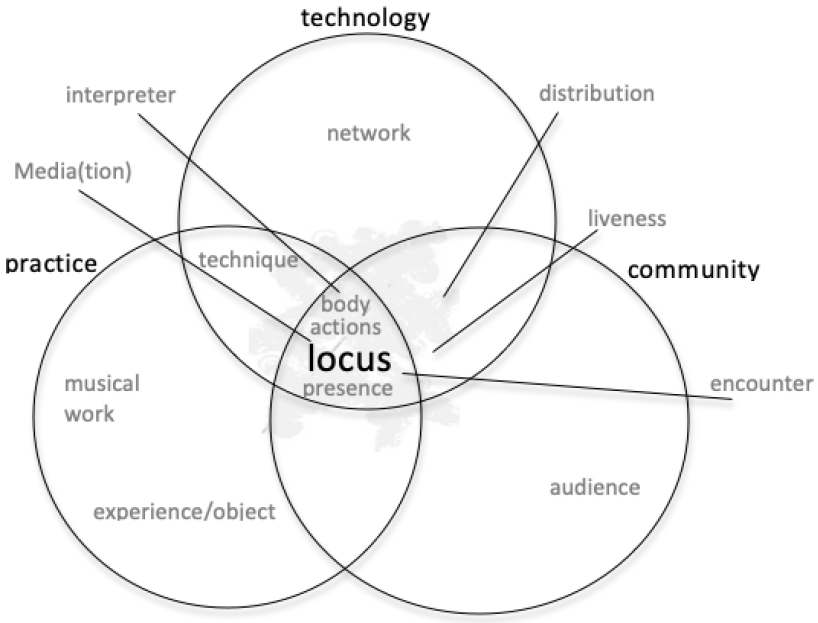

Fig. 1.1 Diagram of Three Headings applied to locus

1.6 Making music

At the level of performance activity, the *doing* of music performance is concerned with the use of sound in a given environment. I have suggested that performance can be understood as emergent. I perform with sound, creating a sound-object that goes out to the world. A quote from the jazz musician, Eric Dolphy, states this clearly. On the occasion of his last concert, he said, 'When you hear music, after it's over, it's gone in the air; you can never recapture it again.' (Eric Dolphy, Hilversum, Radio, 1964).

Diedrich Diederischen (Diederischen, 2015) unpacks that quotation to give a description that is both simple but also invested with an awareness of the contextualisation concerned with more than the physical act of performing. The thought and realisation of the locus is manifest by the act of performance; in this case the playing of a musical instrument.

> *I pick up a musical instrument and produce a sequence of tones. These tones enchant my surroundings and me as I produce them. At some point I grow tired, the tones cease, and the enchantment passes… It was me. I myself, using my talents and abilities - that which belongs to me as a human-being and sets me apart from the animals - gave expression to something; that is, I lent inner states, which are also exclusively mine, and yet whose form is familiar to all other human-beings from their own internal, subjective states, a form that was understandable to others and may have thus been beautiful. I realised myself as a human-being in the dialectic between my nature as a unique individual and my nature as a social and collective being…..(Diederischen, 2015, p.112)*

To examine the processes of performative action and find ways to use the practice to inform the critical methodology, it was necessary to research in a suitable working environment. Although this requires a physical space, for musical instruments, scores and various music technologies, this is more than a place for the purposes of preparation, planning and composing music performance materials. The space forms part of a methodology for challenging the practice, with access to research texts and a procedure

for documentation. Every element has to connect with ideas about its presence and activity which can then be pursued and tested.

Each stage in the making of the portfolio of performative works was used to challenge the process of creating and locating the work. The studio was set up to be able to move between practical activity and access to the literature. The nature of the creative work meant that it would not be possible to narrow down the writing on each case-study to a single viewpoint. Different perspectives addressed a particular work, practice or contexts, in order to investigate and articulate the constitutive elements.

1.7 Projects, case studies and a timeline

A set of performance projects was established for the research and organised as four chapters, with the addition of a review of selected case-studies from the performer's historical archive. The nature of the production processes varied for each project, dependent on factors such as the compositional practice, the transfer through different technical processes, and the final mode of performance. Any timeline for the projects needs to allow for the overlapping and variations in the production process. There are further details about the timescales for individual projects in the relevant chapters. The chart (Fig 1. 2) sets out an overview view of the timeline for the projects and the research.

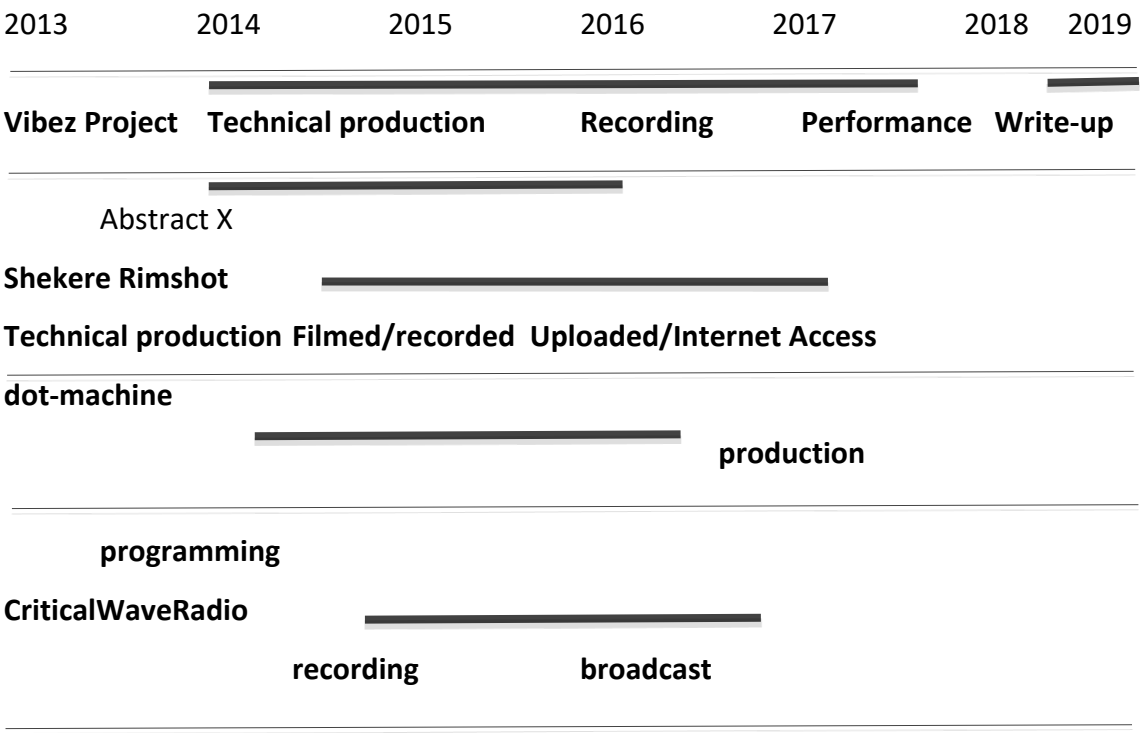

Fig. 1.2

Documentation of the practical work, in the form of audio files, video files, images, computer code and web-based materials, is listed in the Appendix. The chapters on relevant literature and methodology inform the writing and documentation presented in the following chapters.

CHAPTER 5 ***Practice***

Case study 1 Vibez Project - Four pieces for vibraphone and mixed media

Case study 2 Re-Location composer: Jonty Harrison/Simon Limbrick

Case study 3 A First Show : Dominic Muldowney

Case study 4 Three pieces incorporating visual media

Islands : Ed Kelly

The Five : Bret Battey

Hexagon : Lee Westwood

The case studies each define a particular direction for the practice, with each characterised by technical configurations, use of musical instruments and production values. They engage with music and communications technology, collaboration, different

approaches to authorship and identity in the work, virtuosity, and location adjusted factors of time and place.

CHAPTER 6 ***Architectural Spaces***

Case study 1 Sonus Lux/Heavens' Gate

Case study 2 Ascending Fields

Case study 3 3 Church Walk

These works are used to look at concepts in site-specific practice, and consider that physical location is a contributing factor to understanding the workings of the *locus of performance*.

CHAPTER 7 ***Technology***

Case study 1 ***Abstract 28X, Abstract 29X, Abstract 30X, Abstract 31X***

Case study 2 ***Rimshot Shekere***

A set of film/installation pieces that address issues of mediation, film as performance, compositional practice, internet distribution, temporal and spatial dissonance. The *Abstract X* pieces were created during the research period, *Rimshot* and *Shekere* existed as previous works, that were then transposed into a new media environment.

CHAPTER 8 ***Community***

Case study 1 ***dot-machine***

Case study 2 ***Critical Wave Radio- Live Network***

These projects deal with the extension of the performance locus through connected technologies, networks and the internet. The chapter addresses the notion of community, distribution and ownership.

In moving on from this introduction - to address the methodologies, case-studies and reasoning of the argument - it is worth concluding with a definition of a term that could underline the role of practice at the centre of the research: *focus***.** In its mathematical definition it is a 'fixed point relative to which a given curve can be defined by means of a

relation governing the distances between that point and each point of the curve.' (OED, 2017) That places the focus in relation to the points of the curve or figure around it. The focus is at the centre of a space that represents the field of knowledge informing performative action. The dispersal of that knowledge and its relations establishes a basis for discourse on the changing nature of the locus of new music. The performer who connects to the points that inform it occupies the centre. This positioning of the performative activity forms the basis of practice-based research.

2 LITERATURE REVIEW

2.1 Outline

In the *Introduction,* it was suggested that developments in the performance of new music are dependent on a re-evaluation of earlier conventions and a new configuration of the conditions that inform my practice as a performing artist. My practice is undertaken in my role as a performer-researcher, and is key to the research as a tool, providing a methodology and case-studies for the investigation into these new configurations and conditions. In order to address the location of this practice, and to understand the relationship between theoretical and practical ideas, an abstract notion, *locus,* was proposed. The review is directed towards this notion, and attempts to identify the conditions that identify how it has evolved.

The headings *community, practice,* and *technology* indicate groupings of informative ideas and conditions that have relationships and agency with each other. They are derived from a methodology used to direct and investigate the case-studies and are used here to structure the review. The investigation has offered up these conditions as topics to be explored within these groupings and they are also used to direct the review, starting under *Practice* in the place occupied by the performer's actions. The final part of the review draws together writing and reflections about cognitive processes, such as the performer's mental presence and perceptual activity. The research explores types of shifting and hysteresis that can be observed between the different components, with a performer's reflections on the impact this has on the conditioned space for performance.

The practical context for the research, a place for temporally and spatially located activity, means that the physical access to written texts in books and on computer screens was not always possible. The performance space required a different method for engaging with the texts. A series of large posters was produced, combining notes, references and comments taken from the relevant literature, and these were placed around the performance space, enabling the performer to reflect on text-based materials, whilst accessing the activities with musical instruments. Much of the literature was accessed in

this format around the practical space. This enabled a process of reflection and commentary that is outlined in the methodology. The posters are submitted as part of this review and are accessible at:

Appendix 2 /Posters, and online - https://research.marimbo.com

The review starts with the actions of the performance event, the setting out of structures, scores-texts and directions.

2.2 Practice

There is a continuity between the internal operations of the performer's domain and the external factors that have varying degrees of impact upon it, the intention is to focus on the performer's actions and decisions. In order to find a precise set of terms that will enable some clarity at the centre of the performer's actions, this review investigates the activities of performance and its production of musical works. It is worth noting here that the performance activity functions with any interactive sound-making object and spaces defined by networks and engagement.

In a Secondary School Performing Arts department, I noticed a poster that proclaimed a definition of 'performance' for the students. It stated, "A performance is what happens when a performer presents their work to an audience". This short statement highlights some terms that frequently are associated as a description of what constitutes a *performance*, such as the 'presenting' of the work , it 'happens' in time and place. The 'audience' seems necessary, and there is no mention of a context. The 'performer' is the person making it happen. It is the performer, making performance by their actions as an audience. As a performer, I 'present' the work. The poster statement reveals some useful terms that could be applied to my performance and its relationship with an audience. I also note that this poster is concerned with theatrical performance, and that in order to find some of the language and ideas to deal with concepts dealing with performance, I have to read outside the texts focussed purely on musical performance.

I have found that theories about musical performance practice and the musical performance event are mostly focussed on ideas about the score, the performer and its interpretation, rarely dealing with the context, its transmission or the role of the audience. Texts by prominent writers such as Sloboda and Auslander state the lack of these critical viewpoints concerned with the role of different media connecting musical performance with the audience. The discourse in the context of the practice of dance, theatre and film-making covers detailed critiques of performance activity and is concerned with the impact of contextual conditions beyond the location, in my practice, of the musical instrument. The extent of the literature about performance found in these other disciplines has contributed to my investigation in this research. The literature therefore ranges across texts such as musical scores and performance instructions, and those written about the practices of Theatre, Performance Art, Dance, Film, Site-Specific events, Architecture, Music and Communication Technologies.

I start by addressing the term 'perform' as the basis for a performer's actions, and then look closer at concepts informing the conditioned action of performance. The conventional dictionary definitions of the word *perform* range across, 'carry out, accomplish, fulfil (an action, task or function), present (a form of entertainment)' and the word *perform*ing as 'rendering, capabilities of a machine, exaggerated behaviour' in the Oxford Dictionary of English (Soanes and Stevenson, 2005) . Online sources yield some interesting new definitions that point towards a broader, contemporaneous use of the word that can carry a judgmental association with the ability to fulfil competently or successfully. This maybe a symptom of the move towards individual identity and competitive behaviour that seems to be the trend from the late 20th century onwards, an argument that emerges later in this writing under the section *Community*. The performer, carries out the performance, 'now often employed as a heuristic principle to understand human behaviour. The assumption is that all human practices are *performed*, so that any action at whatever moment or location can be seen as a public presentation of the self ' (Goffman, 1959, p.62).

For Performer, we get; 'Artists who participate in performing arts in front of an audience' or 'demonstrate a skill before an audience' (Wikipedia) but also, 'Performers are tactical entertainers, concrete in speech and utilitarian in action. In social situations, they

are informative and expressive'(Keirsey and Keirsey, 1998), and 'They live in the moment'(Keirsey Temperament Website - Portrait of the Artisan® Performer (ESFP)). The term *perform* describes someone operating in the context of a wide range of activities. The term's application to a person's technical competence, demonstration or business acumen has some bearing on its use in an artistic context. The artist-performer's function assimilating expertise from other professional areas, such as a demonstrator, promoter or business model. The performer's activity can include sound-making technologies and spaces defined by communities, networks and different forms of engagement.

Richard Schechner, is a leading proponent of performance and theatre studies, and writes in depth about the topic of performance. He provides the terms 'is-performance' and 'as-performance' in his writings on Performance Theory (Schechner, 2009; Schechner and Brady, 2013, p.49). He writes that, 'Any event, action, or behaviour may be examined 'as-performance'(ibid., 2013, p.49). Though he is dealing with theatrical actions, the descriptors are useful when applied to the performance of contemporary music. Much of his analysis articulates conditions to be found in other forms of performance and resonate within my practice as a musical performer. His questions help me to formulate my questions.

> *How is an event deployed in space and time?*
> *How are the events controlled, distributed, received, and evaluated?*
> *(ibid.,2013, p.49)*

As a counter to 'as-performance', he uses the phrase, 'is-performance' to refer to 'more definite, bounded events marked by context, convention, usage, and tradition'. In this examination of the performative locus, it is the 'is-performance' that is useful. Schechner goes on to state that these identities have become less clear and also touches on some topics that appear in other parts of this research, such as *Technology* and *Community*, as he points towards developments in the twenty-first century.

'Clear distinctions between 'as-performance and 'is-performance' are vanishing. This is part of a general trend toward the dissolution of the boundaries. The internet, globalization, and the ever-increasing presence of media is saturating human behaviour at all levels. More and more people experience their lives as a connected series of

performances…The sense that 'performance is everywhere' is heightened by an increasing mediatised environment where people communicate by fax, phone, and the internet, where an unlimited quantity of information and entertainment comes through the air.' (ibid.,2013, p.50)

Schechner gives a range of different perspectives that follow an ordering, something he calls a continuum, for the performative activities. His observations clearly point to the influencing factor of the exterior context for performance and the how it operates on the interior activity of the performer. There are boundaries, but they are not distinct. His comments about the interaction gives some support to my observations within my practice. They offer support for the idea that separate ideas can be identified inside a structure that is variable and interactive. In my case-studies, I follow this idea of identifying elements and conditions as part of an evolving context. He points to the strength of the relationship between many elements with the following:

> *One way of ordering this complex situation is to arrange the performance genres, performative behaviours, and performative activities into a continuum. These genres, behaviours, and activities do not each stand alone; their boundaries are indistinct. They interact with each other. (ibid.,2013, p.50)*

The term 'boundaries' is useful, because my own reflections lead to questions about the locating, relationship and influence of conditions. The idea of an acknowledged 'boundary' is a topic reviewed later in this chapter. Schechner's writing is also built on observations of empirical action, phrases such as '*to perform* can also be understood in relation to: *Being, Doing'* (ibid.,2013, p.28), which brings us back to the performative event, a place where the *doing* happens.

So far this writing has followed a path to the action, where there is *doing* of something. It might serve to investigate the moment when action happens. There are two integrated parts, the physical and mental activity together. How are the two activities related? The physical action connects to the mind and the thinking informs the action. To understand this, I have looked at Mark Leman's writing on Embodied Music Cognition (Leman, 2008). This body of writing deals with how music might be understood through its relationship to the human body:

> *In this mind/matter relationship, the human body can be seen as a biologically designed mediator that transfers physical energy up to a level of action oriented meanings, to a mental level in which experiences, values, and intentions form the basic components of music signification. The reverse process is also possible: that the human body transfers an idea, or mental representation, into a material or energetic form (ibid., 2008, Introduction, xii).*

The ideas of transfer and mediation through the body's actions provides a way of understanding how the performance activity can be connected to factors concerned with thought and beyond the immediate site of the activity. The possibility that they are transferred or mediated through the body connects the physical action with the active mind and the external conditions that influence it . The two way process that Leman writes about establishes a model for the flow of conditions to and from my performing actions. It also gives a sense of its fluidity and integration, as thought and physical action are linked together, establishing a connection for the conditions that inform them. For me, the two-way process described by Leman is not necessarily synchronous, there is a practice that exists before and after the moment of my performance emerging as the performance event. The transfer, as Leman writes, is most clearly observable at the time of the physical performance, though I question the signification and intention apparent before and after the physical event. As I work through the case-studies, I am confronted with the notion that the performance event is not simply bounded by the physical moment of practical activity. There is a continuity to the process that informs the embodied flow of actions and thoughts. The work done before and after my performance is significant and forms part of the conditioning that establishes it. Leman emphasises the part taken by the physical body in this relationship, and I have brought some of my experiences of learning body movement skills into this research, to discover how they inform my performance. They support me in giving some attention to the conditioning and motivation of my physical movement.

My presence in the performance activity is informed by experiences in the theatre and contemporary ballet, as I took ballet lessons for some years, performed in acting roles on stage, and contributed to a large number of productions that engage with movement as a performance discipline. As part of this review, I include some research that looks at

the embodied knowledge model from the perspective of dance oriented movement. The writing follows my part in a dance research project titled, 'Falling About' (2013)[3]. I took part in a contemporary dance symposium, engaging with the physical work and delivered a paper that challenged ideas about the relationship between sound frequencies and tempo with the responses of the human body, accessed through the possibilities of hearing and body resonances. My paper/presentation, looked at the relationship between sound-frequency, dynamic and implications for the weight of the body in movement, and some understanding of sound and the body, embodiment. I used sound, countered by moments of silence, to present in the space, with an intention to use it to shift, the weight of the human body. I observed the relationship between different frequencies, dynamics and durations of sound on the moving body that feels the sound and resonates with it. Trying to understand if there is a weight in the sound that matches the weight in the body as it moves against gravity.

This work allowed me to reconnect with my previous dance experiences and evaluate my responses and reflections. It allowed to use my physical experience to understand the relationship between knowledge in the mind and the body from the perspective of movement. The dance research supported my investigation of how the practical movement of the human body could be used to reflect upon a flow of knowledge and a continuum of interactive factors.

> *This two-way mediation process is largely constrained by body movements, which are assumed to play a central role in all musical activities. The embodied music cognition approach assumes that the (musical) mind results from this embodied interaction with music (Leman, 2008, Introduction, xiii).*

Leman proposes that the physical human body behaves in a direct relationship with music, so observing it can facilitate an understanding of how music operates, in its delivery and reception. The writing contains many interesting ideas about the different relationship between music and the subjective human, with ideas such as 'direct' and 'indirect' involvement based on the strength of physical connectedness, and the changing capacity

[3] Falling About/ Siobhan Davies Dance Space/London/ 14th-15th December 2013. A paper/presentation I delivered, looking at the relationship between sound-frequency, dynamic and implications for the weight of the body in movement. Sound and the body, embodiment.

for its mediatisation. A key idea I have taken from Leman's writing is that performance is closely aligned with a 'corporeal immersion in sound energy…a direct way of feeling musical reality'(ibid., 2008, p. 4). This feels close to the act of physical performance, it is something I can understand as a performer, but, as Leman states, it does veer towards a philosophically weak position of the description of direct involvement. The 'direct' involvement may come at the cost of being a purely subjective sensing of the moment that becomes difficult to theorise. He proposes an alternative subject-orientation 'based on human action that can be observed from three positions; linguistic, corporeal, transparent, technology-mediated access to music'(ibid., 2008, p.3).

The orientation set out by Leman provides a useful methodology to access the performative action and the nature of the physical actions involved in a performance; especially for a percussionist. Any musically directed action in the physical space is the result of an intention or mental activity. The idea that the ensuing movement embodies that intention, and consequently the musical purpose, not only appeals to my sense of a performative action. It is recognisable and consistent with the energy that produces the performance work.

It is interesting to find the appearance of other modes of access to the performative event in Leman's list, something that will be looked at under *technology* and *community* in this review chapter. His idea of the *indirect* involvement between the subject and the music results from his consideration for the function of *description* between them. The suggestion here is that any *descriptive* process, *verbal description* in his terms, further removes the mutually adaptive resonances between the performer and the audience in the concert hall. The focus on *description* is seen as an intermediary in this pairing and Leman is making the case for an embodied cognition from the need to act in the performance space. The action 'requires mental interpretation then language, explicit in verbal terms[…]Descriptions are not directly observable in sound energy, visualised elements do not necessarily correlate with description' (ibid., p.7).

The moment of physical performance activity, at the most obvious point of observable transfer, has been referred to as *entrainment* (Clayton et al., 2005)(Bachrach and Fontbonne, 2012). A term for the engagement between performers and audience, a consequence of the shared focal point with the attention of the audience towards the

performers and the movements of other people; a sharing of the experience. It is suggested that this facilitates direct involvement. It seems that entrainment also bypasses the descriptive whilst contributing a social network. The performer and the audience have a direct connectedness through the act of music performance and of knowing they are in the same space. This statement has a consequence for later positions in this research, as I will argue that this space is not limited by the boundaries of its physical construction; that it is possible for 'direct' involvement and entrainment to operate in a space limited only by technological development and an ability to apply these concepts.

The focus on the embodiment of a knowledge, that conveys meaning in the performative event, further establishes the concept of the place for action, for the doing, proposed by Schechner. The physical act of performing seems to be centre of the performative event. Musical involvement is based on corporeal articulations (Merleau-Ponty, 2012). Paul Sanden, in his book, 'Liveness in Modern Music (Sanden, 2013a)', uses this corporeal understanding from Merleau-Ponty to reinforce the idea.

> *all perception is embodied rather than just a product of the mind. Understanding of one's environment depends not just on thoughts but also on the physical interactions and on the basis of these thoughts within corporeal experience.(ibid.,p.39)*

The view of the body's motion giving access to a knowledge about the performance space, points to an intermediary role of the performer's body and the presence of the performer between the musical intention and the audience's reception of it. Sanden produces the term 'intercorporeity' to describe the relationship between shared embodied communication; a form of empathetic physical resonance.

Of interest to me is the concern with motion and movement to signify and convey knowledge. The case is made by Leman, Sanden, Schechner, Merleau-Ponty and others, supporting a view that my performance activity connects and interacts with a body of knowledge. Previously I referred to Leman's writing on the emergence of musical knowledge by referring to the central paradigm for his writing, 'that knowledge does not emerge from passive perception, but from the need to act in an environment. In this approach, the link between mind and matter is based on the role of the human body as mediator between physical energy and meaning'(ibid., p.43). A dominant focus on the

empirical action as a source of knowledge does run contrary to the concepts generated within a theoretical practice based on reason, such as Gestalt Theory. Embodied knowledge provides a source that operates within the performance action, dependent less on 'brain processes and the construction of good forms, and more on the empathic relationship with these forms through movement and action' (ibid.,44)

In 'Constitutive Ambiguities'(Kelleher and Ridout, 2006, p.120), Susan Melrose critiques the task of writing about performance practice and exposes some difficulties that arise. It is argued, that in 'performance writing' there is a problem with finding a critical distance from the object of analysis –'that the o*bjectiveness* tends to result from a particular distance from the performance-activity'(ibid., p.120). Our spectator perspective creates a situation in which the view is 'only what we can see' (for musical performance the prioritised sense would be 'hear') which means that observers have to infer what can't be seen (heard).

This is a challenge for my writing as a performer embedded in the practice, because the process of writing moves the critical view from inside of the practice itself, to observations of the performance from a position outside the activity; a difficult position to critique from, as a spectator in the performative space, though outside the activity. The previous paragraph refers to the importance of embodied knowledge and the move to text could be *restricted* to writing only across Academic registers. As Melrose says, 'to a significant extent, it operates through processes too fine, fragile and subtle to give way to the particular fixings that writing tends to impose'(ibid., p.122).

It is useful to return to Goffman's dramatical metaphor for interaction in the performance space when he states, '[the performer] is being watched by an audience, but at the same time he is an audience for his viewers' play.'(Goffman, 1959). This reflective view from outside the performance event, also supports the idea of the engagement between all present at it; the idea that everyone present is an observer and contributor to it. It also supports the difficulty of isolating the critical writer from the performance activity, as raised by Melrose. The engagement between the observer and the event is further highlighted by this description by Marvin Carlson in his 'Three Concepts of Performance (Carlson, 2004)' lists; skill, performativity (defined as engaging modes of behaviour) and evaluation (for *someone*). The integration of these concepts provides

another view of the relationship between the different aspects of the performance and supports the idea of the inclusive 'writing performance' environment outlined by Melrose earlier, tying in the spectator as complicit in the performance activity and giving headings under which to group actions for the performance.

The idea that it is presence at the performance event that signifies it, also makes a case for considering *presence* as topic for enquiry; is it the presence in the space that is necessary to bring about the performance? The idea of presence needs some attention as it contributes to the moment the performance is enacted. The performance engages the presence of participants, with the affects of proximity and role describing their relationship to each other.

So far, this review has focussed on the actions of the performer, *doing* performance in a relationship with the audience, the receivers of the work. And so far, in a physically constructed performance space, by which is meant a building, not a constructed space made by organised data on a computer circuit board or even a space occupied by a community. At the point of *doing* there is thought. It is the place of the presence and mind of the performer. It is informed by information and skills to apply to contents of musical intention. The necessary resources required to make the performance, like the score, the choice of sounds and the musical technique are at the place of the *doing* but before dealing with these entities of the performing event, it is useful to consider concepts about the emergence of the work, the transition from a temporal place to the physical manifestation resulting from it. The work enters a 'fixed period of endeavour', to quote Pearson (Pearson, 2010)and becomes present in the space through the presence of the performer. As the performance emerges in some form of energised realisation into the performance-site, it transforms a previous condition into the place of visible/heard. It is useful to consider this pre-imminent moment, on the cusp of the presence of performance, as this research is not only concerned with the enactment of musical intention, but the concepts that inform the forward movement. The review now turns to ideas about the temporal space at the moment of starting to do something and what informs this movement, where the performer-state is imminent to the embodied act. This movement into the idea of presence implies some kind of boundary device, an idea posited in the writings of theatre director and theorist, Mike Pearson.

Pearson proposes ways of defining the performance boundary. The boundary device is elegant in the way that it can be applied to fluid conditions of performance. A method for knowing when the boundary line that defines 'in-performance' has been crossed and we are in it. It also allows people the choice of defining their own moment of entering and leaving, or establishing a boundary that is not directly linked to physical site or time of the performance activities. This might seem a complex device but, in fact, is functional in its operation and as a kind of critical tool to understand how different conditions affect performative paradigms. Of interest here is Pearson's statement concerning the nature of performance as 'bracketed activity, performance has a demarcated beginning and end, describing a fixed endeavour.' The idea of 'bracketing' to define the moment of performance, or when a person becomes a 'performer' is useful because it establishes moveable parameters for defining the moment of its realisation. It is possible to make an objective view of when the performance starts and ends, and provides a framework for the activity. The 'brackets' serve to 'indicate that it has come into being", that it will 'make its presence felt through the intensity or scale of its intrusion'(Pearson, 2010, p.141). The performance is inside these brackets and the performer only exists as such when operating inside them. The interest here is also that there is no limit to where these 'brackets' appear; they can be placed wherever the performance is understood to be in action. This has implications for the scale and place for performance activity, as to whether it is localised or extending beyond the immediate physical context, and this is an aspect that will appear under the heading, community. It also informs the moment of transition from non-presence to presence of the performer and helps establish the start of the performative act by that presence.

Fig. 2.1 Performing 'Child of Tree', composed by John Cage. A piece that uses the chance method of the 'I Ching' to make choices of sounding objects and structure, with instructions to make sounds; a process of *doing* something.

2.2.1 Presence

If my role as a performer is viewed from the perspective of human presence, I can be understood as being close to the performative act and near to the action. Ideas about proximity inform the sense of being in the space, dealing with what is at hand for the performance. It is useful to take the performer's position in some kind of isolation and look at how that is built up; a stripping away of the performer's apparatus. The performance event starts at the moment something happens - is 'presented' to refer back to the school poster. The performer is 'in the present' doing something and there is a sense of proximity in the placing of this action into a context, with the nearness of the space and other participants. The performer's proximity to the event is where the activity and location form the performer's space. A space made present by the performer.

In Archaeologies of Presence (Giannachi et al., 2012) there is the proposal that questions the use of presence 'and indeed of temporal ground, or flow, in which presence occurs have come further to the fore.' The writing is concerned with a changed view of the term *presence* which has been complicated by new meanings within performance. As it is used in the context of site-related works, where the subject is confronted with their own *here and now*, it has the meaning of being *present* with the mind. Previously the word *presence* was approached as performative claim rather than a state, quality or experience. One of the ways it appears is as *being there*, alternating with *not being*, and therefore a condition of *becoming*. Martin Heidegger proposes a description of *being* and *being present* inflected through notions of emergence and relation, and in which *presence* to and of the other is articulated as process: as an act of persistence (Heidegger, 1927)

> *The word being now no longer means what something is. We hear being as a verb, as in being present and being absent. To be means to endure and persist. But this says more than just last and abide. It is in being means it persists in its presence and in its persistence concerns and moves us (Heidegger, 1927, p.95)*

From this enquiry of the term *presence*, an understanding is gained of its use within the context of the performance event. It helps establish the performer's condition of *being there* in the space and taking on both the meaning of temporal *presence* in the *now* and

present in the work, in a persistent state of becoming in relation to emergence and relation to the context. This *becoming* also supported by Heidegger's *threshold occasion*, when something becomes another and something new is produced as a form of the Greek term for the creative act *poiesis.*

This movement towards a production or *revealing*, informed by a temporal relationship with intentions, instrument and space brings about a production of new materials for a performance. A movement in to the 'bracketed' zone (Pearson, p.126) and an embodied transference to all participates in the encounter with the work. In 'Being and Event' Badiou defines the event as, 'of a given evental site – composed of: on the one hand elements of the site; and on the other hand, itself (itself)'(Badiou, 2013, p.537). This idea supports the notion of the event carrying knowledge of its own operations and of where it is situated. This knowledge can be embodied in the physical presence of the performer, in the performance materials and in the conditions of the performance environment. In the context of a performance, the emergent activity therefore contains this knowledge. It is possible to consider the 'becoming' of performance as the carrier of all the knowledge of that moment, as the event moves through a continuous series of thresholds or new events in a state of emergence. This would be the performance moving from one state to the next in time, as a consequence of the intention to act. The performed knowledge being experienced through the encounter with any other engaged in the performance. Marvin Carlson in his 'Three Concepts of Performance (Carlson, 2004) lists; skill, performativity (defined as engaging modes of behaviour) and evaluation (for *someone*). The linking of these concepts coincides with the inclusive *writing performance* environment outlined by Melrose earlier, tying in the spectator as complicit in the performance activity and giving headings under which to group actions for the performance.

2.2.2 The emerging performance

At this point, there is an engagement with the phenomenal and corporeal aspects of my performance work, as it is revealed, with choices of sound, environment and time. Terms such as preparation, performance behaviour, skills-development and instrument construction are informed by the thinking, creativity and imagination needed to enable me to move through the materials and produce the work.

It has also acknowledged the presence of the observer and to some extent the environment into which the performance is placed. As outlined at the start of this review, a structure starts when it becomes clear that it could be considered for the collection of conditions that determined the *locus.* These conditions could be assigned to a particular grouping according to their character or properties. The groups have headings that identify the associative nature of the conditions under them. The three headings, *Practice, Technology* and *Community* are used. These headings are used to organise an increasing set of terms that can be associated or related to each other. The headings are used to structure the next part of this review of these terms. The first part of this review has established a number of useful approaches for understanding the preparation, initiation and commencement of performative activity. It also lays the ground for a critical approach when looking at the relationships between these fields.

2.3 Technology

The activities in the performance space are mostly framed by my own musical experience. In this research, the range of the performance activity with sound is defined by my practice of creating *New Music* performance. There are commonly held definitions for this genre of music (Griffiths, 1985, Nyman, 1999) and many of them appear within my practice, such as *Art Music, Avant-Garde or Modern Music*, but for clarity, this writing operates within the boundaries of Contemporary Classical Music.

The performance activity starts with decisions about the intention and the ways of carrying that out. There is yet to be a *score* or *musical instrument*. These are written as abstract terms because there is no assumption that they exist in any conventional sense

as real notation and physical object; they are notionally part of the *locus;* their value in the productive and theoretical space can be discussed as any other. Removing them altogether challenges the notion that performance can happen at all, or is it possible to perform with these entities just held in the imagination. It is possible to be present at a performance where there are neither. What is the value of a score or instrument that is only made present by the movements of a mime artist? Removing these entities also focuses the enquiry on the qualities of the other conditions. The physical objects can be removed from the view in order to understand how the theoretical properties function in relation to each other. A characteristic of the evolving *locus* is the influence and shifting between the different strata, and identifying these activities can be clearer without the physical objects present. To understand the world of sound-making and performance, it will be necessary to follow a path using some conventional models and paradigms to build up the active space for performance.

This part of the review falls under the *Technology* heading on the basis that the necessary tools to enable performance are technologies; computer, paper, notation, instrument and other materials. The performance space also appears at the end of this section, as it can be considered as 'an instrument', when it is controlled or performed upon as part of the performance. The choice of a space is a performative decision. The review will move to this subject as it moves from *Technology* to *Community,* a placing that gives some idea of the relationship between these fields and the direction for the argument in this research.

2.3.1 Making a sound

Much of my practice is concerned with the production of sounds, which is often the primary objective in the work. The practice is often focussed on the direct handling of sound, however it might be produced. In my practice, this includes different uses of music technology, such as software and new instruments, as well as more conventional percussion instruments found in contemporary classical repertoire, such as drums, marimba etc. The range of different sound sources at my disposal have qualities that link this work with some of the key transformations of fields like electronic technology and computational software and needs to be represented in this review in order to access research materials for the performance works that invoke it.

Attention to the performance work permits a way of observing compositional components such as structure, instrumentation, environment and even choreographic and ecological elements, it is useful to get closer to the actual sonic qualities of whatever is happening; a way of examining the sounding materials. This review has looked at the effect of sound vibrations on the human body as an attempt to understand the transfer of conditioning factors on to the performer's activities. The sounds produced disperse to the performer and the listener. The sound for the performer is a kind of feedback, providing information about how it was made. The sound itself provides information. As the performer in the continuum, I am listening intensely to the sound, in order to have control over the instrument producing it. The quality of the sound is effected by factors distant from it, such as the acoustic resonances of the space, the quality of the electronic amplification, the materials used in building the instruments, and these are factors that condition my response and the nature of the performance. The reception of sound and its transmission is part of the structuring of the locus for the performance. It might be possible to start with the idea that a sound is simply what it is, a sound; a physical phenomenon characterised by an energy travelling through a medium. Although this medium is conventionally understood as the atmospheric air that produces the effect of vibrating air-waves on senses of the human body, it needn't be limited to air. Sound travels in lots of interesting ways through many materials. The important part here is how we perceive it.

In Mike Goldsmith's 'Discord' there is a thorough explanation of how sound travels and is received by the human form. The idea that if there is "an ear in the room" (Goldsmith, 2012, p. 6) then sound can find its way to the nervous system. The ear and its internal workings play the major part in transferring the movement energy to the human sensory system but there are other ways that we hear something. Much of the human body can absorb and respond to sound, with resonant bones, skin surfaces and even the internal organs. Some of this is still transferred to the hearing mechanisms in the ear but we can also feel as vibrations throughout the body.

Before attempting any metaphysical construction of sound, to establish its conceptual function, and a basis for how it might acquire meanings, representation or objectification, it might serve to investigate within the sensibilities of the practical action. The scope of this review moves to focus on the sound-making part of the action and find

ways to understand the production of the sound energies engaged for music-making; to consider the immediate basic descriptors of what is physically taking place with the instrument. Immediately there are questions. Is it loud, soft, complex or simple in pitch or rhythm, rough or smooth, fragile or robust? With sound there are mental and physiological responses of a range including shock, anxiety, calmness, pain or sensations that cannot be easily identified.

At this point, I would like to convey some of what is sensed in the place of performing. I start with a description of the physical surroundings and how the performer relates to them. The process is aided by the fact that I have taught *performance-skills* for most of my professional career and inform my teaching partly by a reflective approach to my own performing practice; a process of self-development. To analyze a performance, moment by moment, is like reversing a process that has been revised and perfected to work in the other direction. To a degree that retrograde process is what informs teaching and self-development. To find a method for probing into this *doing* whilst it is happening, I created some questions for composers and collaborators and these appear in Chapter 3.

2.4 First steps to performing

So in simple terms it goes something like this; I perform by deciding when to do or not do something by using objects that strike, pluck, stroke and disturb other objects. There is a possibility of changing the action and resulting sound things by connecting or attaching other objects or processes, using electricity or factors of the environment. The place where this happens and the decisions I have to make in the performance, are continually refined. The action can be the set in motion with instructions, such as a text, diagram or other form of notated score. It can result from some external environmental cause or it can start with a temporal process established by myself, or a collaborator. The physical skills are developed over a life-time of practice. Part of the discipline is to learn that a performance does not always require action/sound. Despite the implicit idea of action in the role of performing, there is scope for non-action.

There is a transfer of physical energy that is generated through a mental activity. This transformation of energy can be followed through the whole process of music-making. A body of work that has helped to understand and critique this entity of energy

transference is written by the scientist/philosopher Manuel De Landa. His analyses of different structures and processes have been central to some of the workings in this research and the concept of energy is dealt with in a number of his writings. Specifically, the topic of energy is referred to in 'A Thousand Years of Non-Linear History'(De Landa, 1997), where he uses an analysis of the different states of water, between solid, liquid and gas, to understand the transformation of energy and demonstrate the non-linear characteristics of this activity.

The idea that different forms of energy can exist and transform into other forms seems to address the flow of energy within a musical performance. The literal flow of energy, from physical playing on an instrument, the production of sound that is transferred through the air to the listener, the conversion to nerve impulses, are all transferences of energy. There is also temporal energy involved, this transference moves to and from the mental processes. De Landa's concept allows for the simultaneous and linear transference of this energy, and helps define a function of the performance action. His theories have been useful in other parts of this research. A comparison with this analysis of the transference of energy in a creative process, is a quote from Beethoven, 'I am electric by nature. Music is the electric soil in which the spirit lives, thinks, and invents'. (Cott, 1974, p. 14)

Now that sound-making has emerged as a characteristic of the performance, it might be useful to look at a musical context and isolate some of the sound-actions for investigation. The image below is to give a sense of the performer's own space. The view is from the performer's perspective, behind the instruments. It is an arrangement of instruments for 'Dirt Road' (Smith, 2006) composed by Linda Catlin Smith and scored for violin and percussion. This is the percussionist's setup. To identify the different instruments (in clockwise order) there is an African drum, gong, cymbals, triangle, glockenspiel and vibraphone.

The paper in the middle is the notated music, which is precisely written out by hand. Of interest here is the special laying out of everything, its arrangement around the player – in the position of the camera- and the potential for different sound-making. The movements around this setup are dependent on the instructions in the score, they indicate what musical material to play, on which instrument. There is no setup in the composer's

score but it is clear from the organisation of the musical material that there is a setup in mind. The score puts the notation for the instruments, as it is laid out graphically on the page, as the sounds relate to each other in the physical layout. When the high metal instruments (triangle and glockenspiel) are needed to sound near each other in the score, it works that a close physical arrangement of these two instruments is optimum for the best performance. By looking at this image it is possible to see how the proximity of these two instruments would make them easier to play together. Understanding proximal characteristics in the score can assist a functioning proximal set up of the physical instruments. The music involves movement around the space and actions to produce sound from the instruments.

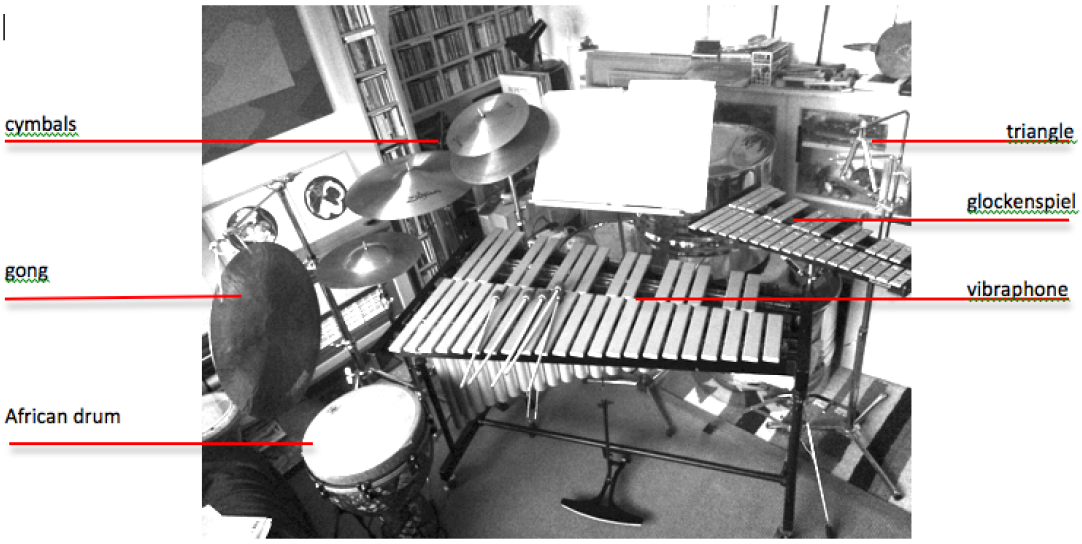

Fig. 2.1 Instrument set-up for Dirt Road (Catlin-Smith, 2006)

The purpose of including this image is to bring the focus into the performative space as a place for sound, instruments and action. It also gives some idea of the knowledge that is embedded into the physical space. The score holds the artistic intention of the composer and the performer uses it to construct a realisation of controlled sounds in a forward moving continuum, emerging moment after moment. A moment informed by the performer's presence at the act of making sound. There are many performative skills needed to do this but, as before, the place for a detailed exposition of musical instrumental skills is not at the core of this research and only referenced when appropriate.

To bring the performer space into focus in this research, it is useful to make a comparison with another instrumental setup for a different piece. The following images

show the layout of the instruments and part of the score for ‘Workout, for Marimba and MalletKat’(Hoyland and Limbrick, 1988), by the composer, Vic Hoyland. In this work, there is a combination of the traditional marimba, set alongside an electronic percussion instrument, called a MalletKat. Both instruments are pitched instruments arranged like a piano keyboard, but played with multiple drumsticks. There is also a computer that is connected to the MalletKat, which plays sounds when this instrument is struck. The two instruments are almost parallel and compared to the previous musical example above, ‘Dirt Road’, there is a similar proximity between the two instruments, making it possible for the performer to play them both. The score shows a line of music titled, ‘KAT’ above the line ’Marimba’, showing which part of the music should be played on which instrument. The two lines of music are proximally spaced like the physical arrangement of the instruments. There is a performative sense to both ‘spaces’, one mirroring the other. The title of the piece, ‘Workout’ implies a theatrical/musical spectacle. It is useful to set out this practical setup to establish the ground for the following writing.

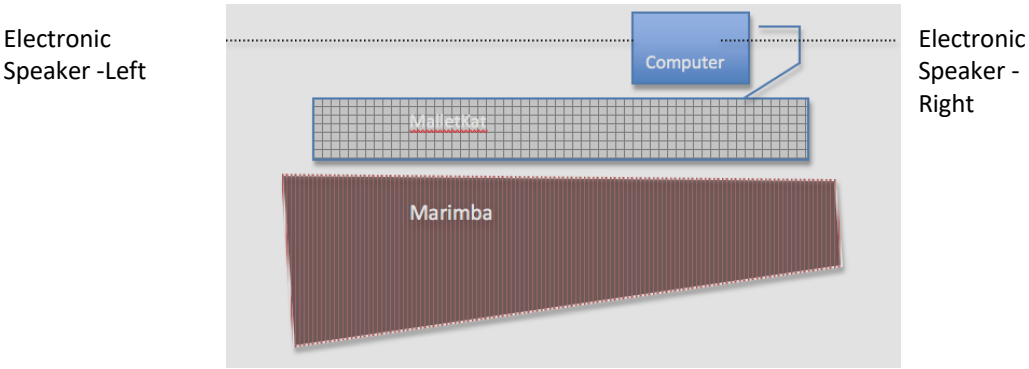

Fig.2.2

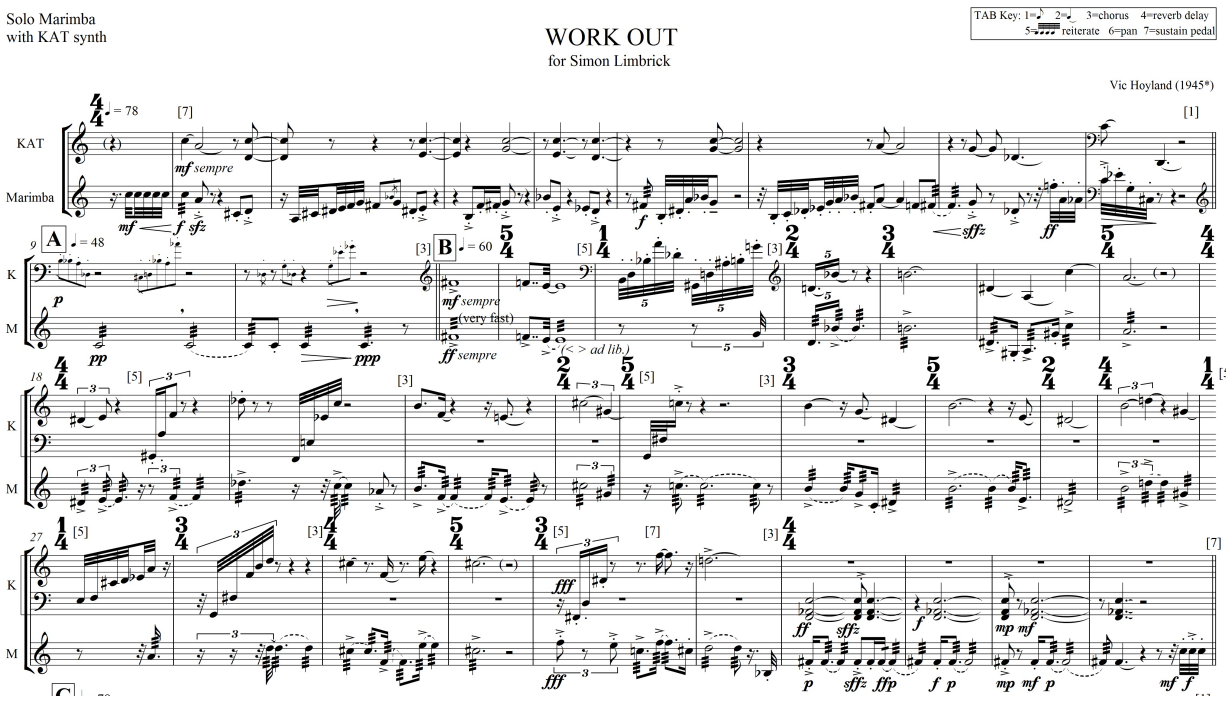

Fig: 2.3 A page from the score of Workout- Reproduced with permission of the composer.

The composer created the piece after a demonstration by myself in 1988, of contemporary electronic percussion. The rhythm and pitch material in the score are complex and the composer has included directions for the types of sounds and where to play them. The composer openly states that he has no knowledge of how to achieve the electronic part and that has been left entirely to myself. The piece has been performed many times, is now recorded, and continues to be improved as technology finds solutions to making it work.

There are two things to look at here. The first is that the realisation of this piece can be seen as an ongoing development, it is a work in progress. Another way to consider this is to see/hear it as a work 'in process'. The piece will always evolve. The piece can operate outside the paradigm of a concert performance, as the instruments and their connectivity to electronic media imply a number of possible interpretations. This piece is an example of a musical work that sets out a different context for its realisation and moves the place of its doing to somewhere outside the conventions of concert performance. The ideas in the work are open enough to find new performing contexts or even to happen in a different kind of musical community, across different mediated networks.

The second point is how the work is made. The composition is the copyright property of the composer, and he is understood as the author in this process. A question here is 'what is the role of the person enabling the piece by creating the electronic part and new contexts for its performance?' The input is clear to see and understand, noting that this piece is dedicated to the performer. This is not an issue of ownership but about the changing role of performers. The developing networked processes for producing new work are to be covered further in this review, under the heading, *community*.

The above two music examples are similar in many ways. They deal with small groups of instruments, use conventional musical notation and fit within an accepted model of concert hall performance. The differences in these examples raise points about technology, instrumentation, notation, sound, artistic practice, collaboration and performance context. The two works expose the varied rates of integration and development that are symptomatic of different parts of our current cultural activity (Contemporary Music). These examples point to the relationship between the different parts of this activity , creating a new dynamic for the space that is occupied by the performer and the audience. A number of these ideas are pursued in the writing around the practical projects that have been made during this research.

As some scores have been introduced at this point in the review, it seems a good place to list other musical works referenced in this research, with a brief commentary about aspects that are drawn from them.

2.4.1 The score

There are actions and thoughts that occur away from the 'presentation' of the work. These would include the gathering of musical skills, sound materials and a 'score'. 'Score' here is a term for any form of instruction employed to bring about the desired realization of the work. The musical work is 'presented', whether it is the result of a previous exposition or a live exploration of an aesthetic perspective that is enabled by a compositional practice. The process of composing provides the materials for the performance and could happen at any time, dependent on the performer's mental and physical virtuosity. So now it is the action of composing that is the focus. What does the

compositional practice actually consist of? On the whole, notated musical scores are produced on the basis that the realisation is made by someone who is not the composer. There are many examples of pieces performed by their composers but the tendency is for the former process to take place. An example of a composer-performed work would be Piano Sonata No.1 by Pierre Boulez (Boulez, 1945), or 'Darkness Visible' by Thomas Adès (Adès, 1992). Both composers working with the complexities of their own scores. Examples of pieces based on scores that are not performed by the composers might be 'TiReTiKheDha' (Dillon, 1978) or 'Bone Alphabet' (Ferneyhough, 1992). I refer to these two works because they are examples of complex score-writing that require a unique approach by the performer. There are decisions about the way these scores are realised in performance which have to be determined by the performer. Despite the composer insisting that the work exists in the score, as written, any practical realisation requires a set of priorities that are understood by the performer and their knowledge of the musical instruments. In further chapters, I review the case for the identity of the work on the basis of the actions of the performer and the different understanding of the space between the score-text and the actual sounding performance. Works based on complex score notation are often dependent on an interpretational approach, though that is not always the intention of the composer. There are musical scores that carry extensive instructions as to how they should be realised and not as a place for the performer to bring individual interpretation. This is not the 'space' of inaccuracy or entirely 'free' interpretation. The performer can be virtuosic by their deliberation and intention for the performance. The topic of interpretation of scored music is one for extensive deliberation and research, so it is referred to in this research, in so far as it contributes to the understanding of the evolved performance locus. The 'space' of interpretation, mediation or distance between the text-score and the sounding performance are factors that inform my sense of an evolved notion of performance practice.

2.4.2 Musical Works and Performances

I include a list of key musical works in which I have had extensive involvement, as a performer, composer or musical director. There are a number of factors that have determined the choice of works. They are often linked closely to a particular context and so appear in the world as integral to a particular performance occasion or location. The

range of different practices illustrated by this list give some sense of my involvement with different kinds of performance and music-making. It includes performer-defined works and those constructed by external components, as happens with mixed-media and site-specific productions. For this reason, the terms Musical Work and Performance are synonymous, for instance when looking at types of improvisation or scores generated on the physical environment itself. The selection of the musical works is made on the basis of their suitability to illustrate particular contextual elements that are informed by the headings: *practice, technology, community*.

Sonus Lux/Heaven's Gate

Composer-Harry de Wit[4], Visuals/Diffusion-Jeffery Shaw[5] , Musical Director - Simon Limbrick
Performed Felix Meritis, Amsterdam (1987)
A multi-faceted work for performance across the spaces of the entire building, that provided free access to the sound materials and external sound-diffusion to the public spaces outside.

Fausto Coppi

Composer-Harry de Wit/Performer- Simon Limbrick
1st Performance Amsterdam, Glasgow, Nebraska USA (1992)
An opera, directed by Jan Ritsema[6]The performance space was open to use by all performers throughout the opera. All performers were on stage and anyone could take any role, making their own choices of performance space and audience relationship.

Sea Values

Film Dir. Lucia King/Composed and performed – Harry de Wit/Simon Limbrick
1st Performance. Amsterdam (1995)
Art film set on remote beach. The landscape and natural elements were central to the aesthetic of this surreal story, with much of the soundtrack literally being played under water. Place as performance by a process using its constituents as the source for the sound materials.

Sugar Beet Factory, Groningen

Composer/Performer-Harry de Wit, Collaborator/Performer-Simon Limbrick
Work-in-progress, Production meetings (provisional date for performance, 2022)
Materials and site researched for site-specific work.
A site-specific piece that integrates the sounds of the building into a sound-score, creating a 'building-instrument'.

Die Orkest

Composer-Harry de Wit, Performer-Simon Limbrick, and others.
Amplified Chamber Orchestra,
Performance. Kaaitheatre [7], Brussels. (1992)
An amplified, re-configured ensemble, with double string quartet, saxophone quartet, chamber choir and percussion.

Ascending Fields

Choreography Rosemary Lee. Composer/performer- Simon Limbrick
1st Performance 1992[8], Fort Dunlop, Birmingham
Site specific work for mixed media in Fort Dunlop Factory, Birmingham. Spaces as sounding-instruments, physical movement of sounds, dance-movement and sound sculpture.

[4] https://www.harrydewit.info/home-en (accessed 19/6/2021)
[5] https://www.jeffreyshawcompendium.com/portfolio/sonus-lux/ (accessed 3/Oct/2020)
[6] https://www.pact-zollverein.de/en/artists-centre/artists/jan-ritsema(accessed 9/9/2021)

[7] https://www.demunt.be/nl/static-pages/144-kaaitheater/(accessed 12/7/2019)
[8] https://www.artsadmin.co.uk/project/ascending-fields/(accessed 12/10/2019)

Tribadabum: sur une rythme fantôme

Composer-Vinko Globokar
Performance, Telegraph Hill Festival, London (2018)
For three percussionists, the work engages the audience to participate in a site-contextual, community-based work.

A First Show

Composer–Dominic Muldowney
1st performance, James Wood, London (1981)
Subsequent performances- Simon Limbrick (1982-83)
Reconstructed work performed Middlesex University Summer Conference (2016)
Electronic soundscape used to a create a sense of multiple performance spaces around a single performer, who moves around the space. The technology and original electronic components were lost, so new realization serves as material for critique of changing speeds of development of the performance context, and the relation between them.

Zyklus

Composer-Stockhausen (1959, UE)
1st performance, Caskel, C., Neuhaus, M. (1959). Performed Simon Limbrick, The Sage, Gateshead (2012)
Physical space determined by the score and the set-up of percussion instruments. Space as component of score. A score-text that engages with the movement and body of the performer.

Child of Tree

Composer-John Cage
1st performance, Detroit (1975)
Performed Simon Limbrick, South Bank, London (2011)
Using the ' I Ching', the performer organises the structure and choice of instruments, incorporating elements of their physical and musical environment The performer improvises within the boundaries of a score-text that can be understood as a locus for the musical work. John Cage says, "Using a stopwatch, the soloist improvises clarifying the time structure by means of the instruments. This improvisation is the performance."[9]

Love Songs 1, 2, 3

Composer, Michel Wolters
1st Performance-Love Story 1, Dartington Summer School (2002)
1st Performance- Love Story 2, Open Public Plinth, Symphony Hall, Birmingham (2002)
1st Performance- Love Story 3, Multi-media, Middlesex University (2017)
Internet networked performance(Love Story 4) planned for 2021
Location specific, mixed media, using maracas and technologies (MaxMSP)

[9] https://johncage.org/pp/John-Cage-Work-Detail.cfm?work_ID=40 (accessed 1/6/2019)

The review looks at concepts connecting the performer's sound and their presence in the space. The possibility of a relationship between the physical and sound energy that establishes a space beyond the proximity of the immediate instruments and presence of the performer. Time and distance are part of the performance event; time for sound to travel and the possibility of remoteness or intimacy. There is a consideration for concepts affecting the physical site and the place of the observer, and beyond these to performance spaces, 'virtual' networks and media-connected communities.

Pierre Schaeffer's writing indicates a direction for the future of notation in relation to performance practices. He writes that the score-text is defined by the work with sounding materials and sound-objects, and resists the imposition of conventions of musical notation onto a practice that is constructed around sound-making. He writes, 'it would be easy to yield to the temptation of paper, which is contrary to the spirit and the method, and even the potential, of concrete music' (Schaeffer, 1952, p. 25). His resistance to the introduction of musical notation is partly based on the fact that any graphic reduction of the sounds being used would not provide enough detail to describe the sounding materials. Classical music notation defines values for pitch, rhythm and dynamics, with possible further instructions for the performer to interpret, such as markings for phrasing, and expression. There are still many sound qualities and modes of expression available to the performer that are beyond Western Classical music notation. The performer has to apply knowledge of the musical context in order to judge what sounds and articulations are required. In the case of Schaeffer's sounds, conventional notation would be further removed from its purpose. The sonic qualities of Pierre Schaeffer's sound corpus are worked with directly and are characterised by factors that are not described usefully in notation. His equipment allows him to work on the sound structures directly. He continues,

> *it is made up of pre-existing elements, taken from sound material, noise, or musical sound, then composed experimentally by direct montage, the result of a series of approximations, which finally gives form to the will to compose contained in rough drafts, without the help of an ordinary musical notation, which becomes impossible (Schaeffer, 1952, p. 25).*

Pierre Schaeffer had access to the technology he needed because he worked for a radio station. It is significant that the musical technologies now available have a dramatically more capability beyond anything possible in the 1950s. This is significant for the research because this access has transformed the performer's role in the performance context. The attitude towards notation and whether it is useful when dealing with music technology has also contributed to evolved ideas about what constitutes a musical score. The idea that the score can be derived from entities other than notated music is not new, there has always been a challenge to the idea of music being notated, especially for music that is learned as part of an aural tradition. There has always been a possibility of a sonically directed musical instruction, if this enquiry were to include , for example, the subject of aurally learned jazz or folk music. There are elements of these musical genres that have transitioned into the practices of classically based new music, bringing musical disciplines that develop the musical language of the performer. Identifying the score-text for a performance can draw on alternatives to notation, and new music technologies provide a technical and aural framework that can be understood alongside other non-Western Classical music contexts.

The use of technology to create and structure the score for the performance is a dimension that impacts the practice of new music. In Chapter 5, there are case-studies that investigate scores defined by the functions and structuring of the technological.

2.4.3 Space, sound and movement

Musical instruments are manipulated to introduce sound wave motions to the air via different media; excited air, resonance, but also wood, metal, string, water, paper. Sound travelling through air would be the most recognisable manifestation, but other forms of sound might be experienced through water, glass, plastic and other possibilities (de Wit, 1982). The sound is perceived, as hearing experienced through an empathetic response in the human body. Usually this happens in the physiological structure of the ears, though also possible through other parts of the human body through transmitted vibrations of the bones and surfaces.

> *From one body the hand then rises to point openly into the air, finally falling back down again onto the other's body. This arc, this soft trajectory, is a beautiful rendering of sound as an itinerant movement that immediately brings the two together; it suggests the intensity and grace with which sound may create a relational space (LaBelle, 2013, xvi)*

As a percussionist, I am often dealing with the distances between objects and the time of the movement bound by cause and effect. The control of the movement is related to the resulting sound and its place in time. In his book 'Acoustic Territories/Sound Culture', Brandon LaBelle describes a visual metaphor of the movement of the hand, moving from one person to another (see above). The use of this metaphor, to understand the movement and the time for its journey, provides another way of understanding how knowledge can be a constituent of something moving in the physical world. The metaphor could run in reverse, as it is possible to go back in time and say that the performer anticipates the moment of communication in relation to the subsequent journey of that sound being sent to meet the listener: The performer presenting the sound in a relational space. (ibid., 2013, p. xvii). This provides a journey across the time/space, or as used earlier, the sphere of occasion that links parts of the sound journey, in the context of a space that has some attached value or even meaning. The movement also contributes to the definition of the performative-space that brings it to life as a thinking-space. The continuation of this sound journey builds an environment that touches all aspects held within it. LaBelle goes onto describe how the arc of sound elicits a listening response and the sonic figure forms a binding structure of temporal significance. This fixing of place and time, confirms the moment of the here and now and anyone present to experience it. He writes, 'Sound might be heard to say, This is our moment (ibid., 2013, xvi)' and establishes a location with, 'This is our place.' (ibid., 2013, p. xv11). Ideas about the relation between sound and space inform the decisions of the performer and the structuring of the performance context.

Wörner's writing in 'Stockhausen. Life and Work' (1973) gives a sense of the changes to how new spaces and configurations of sound technologies will provide a new way of listening, although the audience are regarded as *receivers* of a the new methods for manipulating the movement of sound. 'The old indivisible relationship between music and space here receives a new impetus, movement of the sound, for the sounds

continuously ‘wander’ from one to another of the loudspeakers placed around the audience. Suitable listening areas for this kind of ‘music in space’ do not yet exist.’ (Wörner, 1973, p. 160). This description, of a spherical area furnished with loudspeakers , and a suspended acoustically transparent audience area to allow sound from all directions, could be applied to the Sonic Arts Research Centre (SARC) performance space at Queen’s University, Belfast. A venue in which I have performed many multi-media compositions, some of which appear in this research as case studies. These include ‘Shekere’ and ‘Asi el Acero’ by Javier Alvarez, and my own ‘Rimshot’.

New configurations of the audience relationship to the sound production go back to the well known example of the Philips Pavilion, with the combined architectural and compositional direction of Le Corbusier, Xenakis, and the studio produced work *Poème Électronique* of Varèse, (Matossian, 1990, p. 112). The possibility of transforming the performance space through a relocation of the sound produced, using audio speakers and sound diffusion, is another possibility for setting its boundaries, conditioning, and engagement with the audience. The movement of sound in the space as a component of the score and the use of sound to define a performance location are two ideas that have become familiar to audiences, with examples such as Susan Philipsz’, ‘Lowlands’[10] (under a bridge in Glasgow, 2010), ‘Study for Strings’[11] (2012) and the electronic parts to pieces by Stockhausen, such as ‘Kontakte’ (1958-1960).

A collection of texts that addresses the relationship of the body to knowledge and helps to understand some of the physical dynamics of the performance is ‘Knowledge in Motion**:** Perspectives of Artistic and Scientific Research in Dance**’** edited by Katherina von Wilke. It critiques aspects of the audience/performer relationship from the perspective of performing body (Gehm, S. & Husemann, P., 2012). The critical approach from the perspective of a dance practitioner informs the writing concerned with the engagement of the human body in movement related to my musical performance. It provides theoretical ideas that draw on the practices that have informed my own use of dance and choreography.

[10] https://www.tate.org.uk/whats-on/tate-britain/exhibition/turner-prize-2010/turner-prize-2010-artists-susan-philipsz/ (accessed 3/3/2019)
[11] https://www.moma.org/interactives/exhibitions/2013/soundings/artists/11/works/ (accessed 3/3/2019)

2.5 Digital Conversion

The recognition that digital technologies are developing at a rate comparable to that of the Industrial Revolution of the 19th Century, has a consequence for the investigation of any performance that integrates the new media. It is happening at a different rate to other functions of the performative environment. New technologies in building construction continue to impact on the spaces we use at a different rate to the functions they contain. The construction is not only defined by its visual and physical profile but also by its interaction with people through listening, moving and living; activities that are developing at a faster rate than the processes of construction. The notion of the notated score has been reconfigured as new technologies provide different media between the performative elements. The fact that the conventional printed score is more frequently delivered to the performers own personal computer, with the composer-performer relationship nurturing the possibilities of re-editing or personalising of performance materials, has lead to a new dialogue. The roles of the composer and the performer are more integrated, reflecting practices that have been subjugated by the control of publishers and cultural hierarchy. The new technologies have provided a framework for individual voices and access to operate in a global framework. With the progressive differences between the developments in many of the locative components operating at different rates, there is often a misalignment between the artistic, practical and social activity. It is also possible to relate concepts drawn from this field of accelerated development and consider them in relation to the wider view; the social context where these new things interact and change our living environment.

Fig. 2.4 Art Gallery as Performance Space. Longside Gallery, Yorkshire Sculpture Park

Rob Stone suggests the window as an image of the condition of knowledge (Stone, 2015) and matching this with the anecdote from John Cage about Christian Wolff's performance of one of his piano solos, ' when asked if he wanted to play it again with the window closed, to keep out the external sounds from the harbour, he said it would make no difference ', it is possible to arrive at an interpretation of sound as the voice of that knowledge.[12]

The impact of communication technologies that are made quicker and more fluid because every piece of information is digitised has reached into nearly every aspect of our social structures. The digitisation of the data that is needed to inform encounter means it is broken into binary code that can be transported across multiple networks and then reconstructed. The data travels across multiple parts of the network, optimising the best routes and is re-aligned at its destination according to identification embedded in the code. The digitised data does not travel in sequence as linear analogue data. It is fractured, given an identity, sent across multiple networks and then reconfigured at its destination. For the performer, everything is faster and allows responsive communications across

[12] (Limbrick, Middlesex PostGraduate Presentation ' Where is Music Performance Located', 23 November 2015)

media and networks, but it also has an effect on aesthetic values in the work. There are new qualities such as digital artifacts, sounds, and characteristics due to synchronisation and loss of data. These have some value as creative components. Of interest beyond these clicks and stutterings is the idea that these blemishes give the medium some characterisation, partly because it reveals its human-made source, but also because the media has some identity of its own. The domain of electronic music is partly occupied by creators using older technologies, and hacked circuits that produce their own aesthetic qualities. The League of Automatic Composers of the 1970s prioritised interactivity, producing richly characterful 'glitchy' electronic sounds that have influenced many performers since. The computer assistant HAL (Kubrick, 1968) had a slightly odd human-like voice, which was actually modelled on real research into voice controlled computers, but more importantly was the fact that it had integrated into the entire structure of the human characters and made machine-based decisions. The possibility of a machine identity is already part of the aesthetic of current practice and the integration into the performer's environment a tradition laid down by technologically enabled performance art. The performer at the centre of this research has integrated computer and other electronically enabled instrument technologies since the 1980s. All of these components have had an aesthetic value to contribute, in their sound and/or operation. Digitally enabled instruments bring new qualities.

2.6 Community

In *Performance and Place* **(**Hill, L. & Paris, H.,2006) the integration of technology has produced a different kind of space that is bounded by the limitations of the technology rather than a physical location. For the performer, the performance has new values of engagement and presence in the work. In Chapter 7, there are case-studies concerned with networked performance and the relationship between the participants. It looks at ideas around different models of *community.* The suggestion that this *community* is located across a network means the performer has to reconsider the conditions, such as *encounter* and *being-present* in the work, in an evolved approach that communicates and engages with the other participants. The book describes a sense of "placelessness..we colonise cyberspace as if it is the only place left. Communication technology means that where you are geographically is now less important in many cases than what kind of material access you have to wireless technology".(ibid.,p.3)

2.6.1 Greek performer

At the start of this review, I referred to a statement on a school poster, in the section *Performer*. It stated, 'A performance is what happens when a performer presents their work to an audience'. It echoes similar descriptions that can be traced back to the time of the ancient Greeks, when it is thought that performers, sometimes known as rhapsodists (Gk: ῥαψῳδός), presented texts such as Homer's 'Illiad' as a kind of song, possibly accompanied by instruments such as a phorminx or kithara. The purpose for using melody and rhythm was to engage the listener and to be able to emphasize key elements. Plato's *Dialogues* refers to the role of musical performance in a conversation with Glaucon (Plato, 1970, pp. 165–171), describing the importance of the use of melody, harmony and rhythm to communicate the text. Techniques such as the use of rhetoric or ʻmodes of persuasion' (Aristotle, 367AD, bk. II), using the performer's credibility (ethos) and an appeal to the audience's emotions (pathos) appear in performance practices.

My contributions to performances of modern adaptations of Greek plays at Epidaurus, Greece, and Karnuntum, Austria, give a good sense of how the physical location can impact on the performance space. The physical scale and location within the historical communities supports the view of how important these sites were to Greek culture of the period. The earliest dates for dramatic performance are around 566 BC [13], but the theatre spaces that are visible today were constructed over the following 150 years. The architecture provides some early models of the physical placement and relationship of the performer to the audience. The few pieces of Greek documentation from the period support the function of these places, and the existence of performers with demarcations for different purposes. The remains of architectural structures, like those at Epidaurus, Greece, provide information that has been used to understand the physical site of ancient performance practice. Greek texts, as written plays or documents that have captured oral traditions, can be considered as activities in these ancient spaces, presenting the possibility of mapping the activity on to the spaces. This placement of the activity into the space provides a way of accessing a kind of spatio-temporal conjunction, with the possibility of understanding contextualised physical performance practices and their

[13] Rehm,R.,1992. *Greek Tragic Theatre*. Routledge: London, NY, Canada.

cultural integration. Much of the ancient architectural terminology has made its way into the current vocabulary to describe parts of the physical space, for instance; the smaller theatre or ōideion (“the singing place”, Gk:Ὠδεῖον) for musical performance, and the larger with its central performance area, the ‘orchestra’(Gk: ὀρχήστρα) and audience seating ‘theotron’("a place for viewing", Gk: θέατρον). In Ancient Greek theatres, the area occupied by the performers was integrated into the audience space with the seating surrounding it for most of a circle of seats. The circle is broken to make way for a structure that provides scenery, entrance and exit doors, stage props and machinery (e.g. A lifting crane used for possible ‘ex-machina’ delivery of a God character to resolve the plot). The performers are placed in the centre and can be viewed and listened to from a space that surrounds much of the stage area. The Olivier Theatre at the National Theatre, South Bank, London is a modelled on Epidaurus, though smaller in scale.

From the evidence that remains, it is possible to get a sense of the physical size of some of these ancient sites. The scale is comparable to that of contemporary large stadium and arena, and gives a sense of the energy and cultural demand for performance spaces from around 500 AD. As the concepts of that period are still at the core of much of contemporary performance, then some understanding of the performer/audience relationship might be carried with it. It is possible to question the way performance functioned 2500 years ago and compare those observations to the contemporary space.

The contemporary *locus of performance* has evolved in response to challenges from a period that started with industrialisation in the West, and now connects to the entire world in an era of global networks. As new social structural orders are worked out, the place for communication, creativity and human presence is evolving, with challenges to many of the paradigms carried since the ancient Greeks.

Giorgio Agamben, in *The Man Without Content,* gives an interpretation of the difference between creativity and production. It gives some insight into how practice can be approached and a sense of what it represents. The *locus of performance* is manifest in the act of performing, and the ancients understood this as being bound by its own action. The *locus* is bounded by *praxis. '*The differentiation between the creative act and that of making, in that the former, ‘poiesis’ or poetics, produced an opportunity to discover truths and the latter was bounded by its own action, ‘praxis’ a term now commonly translated as

practice'(Agamben and Albert, 2003, p. 68). The practice referenced in this thesis is both creative and practical, in an act that makes a conceptual space and an opportunity for *praxis* and the truth established by encounter, communication and community.

2.9 Work made present

At the centre, where the work is made present, are the challenges of determining how the creative materials are produced and communicated, through the experience and reception of the participants, performer and audience. As the focus moves out from this centre, to understand the impact of its surroundings, it also reveals the nature of the structures around it and how they are affected. The search for understanding and appropriate methodologies need to move towards and away from the performative centre to inform a locus that, with a sense of multi-directional movement, can be thought of as sphere of activity. This 'soft' sphere locates the integration of the thinking with the material frameworks.

Other boundary or locative analogies are also useful, such as the image of a door or window, to expose concepts of internal and external space, the assimilation between practical and theoretical operations, and the continually shifting frontiers of individual and collective production. These images also link the thinking to the dominant roles of physical world of architecture and environment. The environment for performative action is also constructed with technologies, so concepts that form networks, accessibility and materials may be useful. As a way of getting to the thinking-space it is possible to consider Foucault's proposition, from his critique in 'Death and the Labyrinth' of Roussel's 'Locus Solus' (Roussel, 1914), of a space in which things can be organised in relation to one another; 'that is where they all have their *common locus*, like the umbrella and the sewing-machine on the operating table' (Foucault, 1989, p. p xv11); the table being a tabula or place to contain separate entities. Closer to musical activity, Adorno provides a useful description that gives a sense of place to musical activity, 'on the threshold of historical time, that music represents at once the immediate manifestation of impulse and the locus of its taming.'(Adorno, 1991, p. 29)

The trajectory of the research moves from the 'direct' experience of the performer (Leman, 2008, p. 4) outwards to the wider environments where the activity takes place;

spaces confined by our knowledge, movement and survival. Spaces expressed by Bachelard in 'Poetics of Space' (Bachelard and Jolas, 1994), Arnaud's ' Je suis l'espace ou je suis' '(Noel Arnaud. L'État d'ébauche,1951) and Lefevre's 'The Production of Space'(Lefebvre, 1991).

Bachelard in *The Poetics of Space* (Bachelard, 1958), creates this image of the living environment that turns it into a living and lived-in space. His writing turns the space into a place that is characterised by knowledge. To address a performance space in the same way would reveal its personality, characteristics and the factors the constitute it. The location bounded by the performance is constituted by elements that can describe its functioning, its existence.

> *A house constitutes a body of images that give mankind proofs of illusions of stability. We are constantly re-imagining its reality; to distinguish all these images would be to describe the soul of the house; it would mean developing a veritable psychology of the house (Bachelard, 1958, p.38)*

I have found useful conceptual tools in the writings of De Landa. In **'**A Thousand Years of Non-Linear History' (De Landa, 1997), he writes that 'all structures that surround us and form our reality are of specific historical processes'(ibid.,p.13) and that are part of 'any system in which the dynamics are not only far from equilibrium, but also nonlinear, that is, in which there are mutual interactions between components' (ibid., p.14) although his ideas are based on scientific phenomena they can be applied to social and cultural contexts. They provide a way of articulating and understanding the relationships between disparate strata within a cultural context, whilst being able to distance the complex operations within them. This makes it possible to investigate the interaction between the different layers and analyse the ways that they combine. De Landa speaks of 'nonlinear combinatorics'(ibid.,p.17) which names the emergence of entities derived from previous states. This is developed into, 'certain combinations will display emergent properties, that is, properties of the combination as a whole which are more than the sum of its individual parts. These emergent properties belong to the interactions between parts'. Interaction takes place as the performer produces the work, through their actions, where its parts are made apparent. As the work emerges, the performer is in a position to investigate them.

As De Landa writes, 'it follows that a top-down analytical approach that begins with the whole and dissects it into its constituent parts is bound to miss precisely these properties.'(ibid.,p.17) In his book 'Philosophy and Simulation' (De Landa, 2011), he deals with '*mechanisms of emergence'* (ibid.,p.3) that provide methods for identifying different activities that relate to each other where 'the historically contingent identity of these wholes is defined by their emergent properties, capacities, and tendencies' (ibid.,p.3). It might be possible to apply this to the emergent activities and conditions of performance, in order to identify the outcome of change on the whole. Following this through to my main headings, it is possible to observe the emergent performance activity informing us about the relationships between dimensions found in *practice, technology* and *community.*

In 'War in the Age of Intelligent Machines (De Landa, 2003), there is a useful way of looking at the disconnection and dissonance in his use of the term *friction*. He uses it to describe the resulting disruption, congestion or functional breakdown caused as a result of changes in speed and exacerbated by a crossing of another entity. This term provides a way of looking at the effect of technological developments across different areas of a cultural activity. An example is to apply it to the operations of architecture and musical performance to investigate the kinds of *friction* found there.

The nonlinear approach to be found in De Landa's writing, provides a method for looking at the vertical relationships between the influences on the performative event, and to understand the spatial concepts, it is useful to look at the ideas put forward by Lefebvre in 'Rhythmanalysis. Space, Time and Everyday Life'(Lefebvre, 2013). The process of critiquing the subjects of space and time are done through a process of mapping the human sensibility of rhythm onto the perception of time, to understand the 'interrelations of time and space in the comprehension of everyday life'(ibid.,p.4) The approach to this understanding places the corporeal figure through this mapping, 'inside and outside of observed bodies, to unify them by taking his own rhythms as a reference'(ibid., p.29). Without omitting the spaces and locations, he makes himself more sensitive to the temporal. A method of 'listening' that resonates with the performative aspect as sound, 'Without omitting the spatial and places, he makes himself more sensitive to times than to spaces…He will come to 'listen' to a house, a street, a town, as an audience listens to a symphony'(ibid.,p.32). The division of space, through its division into rhythm, constructs

an understanding of time, and 'His body serves him as a metronome'(ibid.,p.29). The performer at the centre of the *locus of performance* dividing time with their embodied knowledge of rhythmical movement.

This writing provides a method for understanding the movement in the event and the transition between different stages, as performance progresses. Bachelard writes, 'The rhythmanalyst will give an account of this relation between the present and presence: between their rhythms.'(ibid.,p.32)

The previous two writers provide methods that can be applied to an analysis of the performative locus, an approach that is expanded further in the 'Methodology' chapter. The review has covered a wide range of disciplines and related ontologies that, in relation to each other, form a way to analyse the evolving locus for performance activity. Methodologies found within this process are applied to the empirical materials of this research, and will be used to test the case for an evolving *locus of performance.*

3 Methodology

Introduction

> *the window, the noises distinguish themselves, the flows separate out, rhythms respond to one another. Towards the right, below, a traffic light. On red, cars at a standstill, the pedestrians cross, feeble murmurings, footsteps, confused voices……..The harmony between what one sees and what one hears (from the window) is remarkable. Strict concordance. (Lefebvre, 2013, p.38)*

Lefebvre depicts the sounds and sights from a balcony overlooking the Pompidou Centre in Paris. His description is filled with details of the real world and yet comes to life in its use of concepts such as rhythm, flow and harmony. Fluid dimensions, not the fixed rules of its objects, determine the sense of complicated movement. It is a physical space and one interpreted on the basis of knowledge. It is a locus defined by that knowledge, and for Lefebvre an urban metaphor for way that knowledge operates. The locus of performance is as complex as the view from the balcony and requires methodologies that will allow the development of critical perspectives to understand its functions.

This chapter sets out the process of establishing a methodological framework to address the complex nature of the performative locus. The methodologies support the development of theoretical ideas, as they appear in the chapters dealing with the case-studies in a practical environment, and a framework that affords a new way of thinking about the locus of contemporary performance.

The methodologies function in the practical environment of my practice, in order to research the nature of an evolved performance locus. The projects undertaken during the research period, and my historical background, are used as part of an auto-ethnographic methodology for research where the researcher is the subject and the researcher's experiences are the data (Ellis et al., 2011). The research is concerned with ideas and the problems arising from an evolved notion of the performance locus, not the grounds for an aesthetic critique of the work or performances done. As an artist, I am focussed on the work of creating something, and that takes place somewhere. The

'somewhere' is more than the physical location, as stated in the Introduction to this thesis. It is established by the actions of my performance actions, and it is these that provide a perspective for understanding the locus of performance. In 'Experimentation Art as Research', Kathleen Coessens writes of an 'web of artistic practice'(Crispin and Gilmore, 2014, p.69) and describes five dimensions that inform a musician's interaction with their environment. These are 'embodied know-how, personal knowledge, the environmental, the cultural-semiotic, and the receptive' (ibid. p.69). The idea that the performer's actions are connected to and informed by dimensions beyond the immediate creative activity, is one that can serve the understanding of the performance locus. It points to a methodology that uses the performative activity to purposefully address concepts that have become problematic for the locus, as it changes. It provides a research methodology that is enabled by the practice. Coessens' use of a 'web' as a metaphor is useful in understanding the artist's connection to the dimensions, though it depicts a view looking out to those influences. My use of an overlap between the spheres of *practice, technology* and *community* is an attempt to understand the performance locus as a theoretical and practical space bounded by activities of the performer, which is occupied by informative dimensions, and proposed as practice-based research.

It is necessary to focus the research on the informative conditions rather than the aesthetic nature of the work. Godfried-Willem Raes, in 'Experimentation Art as Research' (Crispin and Gilmore, 2014, p.56), asks the question, 'What is research in the arts?', and suggest that 'there is something being researched and that a question, a problem, exists with respect to that something.' The idea of an evolved performance locus has a significance for music performance beyond my own practices. As Raes states, it must 'supercede the significance it has for the individual researcher'(ibid. p.56).

Methodologies were tested, developed or discarded as the research proceeded, and the methods that seemed to be productive and consistent were used to assimilate a body of evidence. This approach was also applied to the balance between the amount of theoretical writing and practice, with a consideration of how they match the different modes of activity in this research, referring to relevant texts (Doğantan, 2015)(Biggs et al., 2010). As this text constitutes part of a mixed-mode research thesis, it addresses those conditions and ideas made accessible through my activities as a performing artist. The review looked at a range of discourses about performance, including theatre, dance, sound

art, performance art and music performance, in order to find methodologies that could be adapted or remodelled for use in this work.

3.1 Chronology

There are case-studies carried out during the current period (2013-2019), and other examples taken from my historical background in support of the auto-ethnographic methodology used in this research. A selected version of my historical background is set out as Chapter 4, with a focus on key moments that reveal changes in the dimensions effecting my performative actions. There are examples that provide materials for further investigation and these are dealt with in the relevant chapters. For instance, there are cases where the physical location is a dimension of the performance, so the investigation continues in Chapter 6, which articulates ideas about physical space being understood as new instrumentation in the work. Another example refers to a changed relationship with the audience, and is discussed further in Chapter 8. The examples are drawn from a timeline that starts at my first involvement with music performance.

The timeline of the case studies undertaken during this research are as follows:

‘Vibez Project’.

Solo vibraphone and electronics.

Work with Composers.	March-June 2014
Rehearsing, preparing, recording.	June 2014 – January 2015
Performances and touring.	October 2017 - March 2018

‘Abstract X’

Four audio/visual works	June 2013 – Aug 2015
Production, Max-4-Live programming	June 2013
Filming, editing	July – March 2015
Web launch – Youtube	Aug 2015

‘Shekere’ and ‘Rimshot’ 2014

Initial programming Pure Data, Ableton Max-4-Live.	January 2014

Production, filming, editing	June - Feb 2015
Performance- Audience/Performer responsive versions	July 2015
Web launch – Youtube	July 2015

‘dot-machine’	
Composed, visual design constructed	June 2013 - March 2014
Recording CD	Sept 2013 – April 2015
Performances, installations, BBC Radio Broadcast	June 2013 – Nov 2017
Online Website	June 2014
rebuilt (Dynamic HTML 5)	July 2021

Critical Waves/ Resonance FM – dot-machine	
Recorded – Wilderness Project Studio	April 2015
Broadcast online	July 2015

A critical framework was developed and refined as the investigation followed a pathway through different phases of activity. The methodological framework addressed multiple projects. These phases establish a timeline to the research. Each project had to evolve according to its own practical and aesthetical criteria. In some instances, projects overlap, as different activities required their relevant technical, locative and creative focus. Planning and delivering a series of concerts in different venues can take over a year to achieve. Studio-based activities are split over different locations and points of access, so broken down into different work periods.

A useful structuring and methodological approach was found in the work of Sanden (Sanden, 2013b). Ideas in his writing on ‘liveness’ engage with the relationship between corporeal and temporal activity, providing many useful ways of handling the balance of practice and theory in the context of musical practice. He refers to a central governing principal that supports a concept, perceived and articulated from a number of perspectives, each corresponding to an identifiable characteristic. He then goes on to identify ‘categories’, taken from a wider discourse, that are used as areas of ‘a dynamic network of relationships rather than as absolute values’. These ‘categories’ are then invoked in different registers across his case-studies (ibid. 2013, pp.11–12).

Sanden's methodological approach is adopted in this research and a list of terms such as *dimension, parameter, perspective, condition*, is used to identify headings, in similar method to Sanden's categories. The relationships between these categories is what appears to inform the performative locus, as much as identifying clearly definable agencies and components. A taxonomy of terms that can be tested for their capacity to contribute and inform the locus of performance provides a method for the investigation. It avoids the difficulty of attempting to use finite definitions to describe theoretical ideas in a dynamic context, and supports their use in describing the multivalent nature of the performance locus. In following Sanden's methodology, categories are understood as modalities that collect ideas together because of the way they function. An example of a particular modality is the view of the practice through the identification of the musical work by its score-text or directions. Another modality is that of the view from within the practical activity of the performer. The different perspectives offered by each modality provide a methodology for the identification and categorising of concepts.

3.2 Practice as knowledge

The action of creating performance works was a central factor in the discovery of evidence and the investigation. The notion that 'spontaneity of knowledge can only arise from the union of the sensible and thought'(Kant, 2007, p.85.) is used to understand the how the different elements inform and function in the research. The close link between knowledge and sensory experience is fundamental to the actions of performing on a musical instrument in a performance environment. Knowledge acquired through an understanding of how the sensations contribute to the experience of being in a musical performance can consolidate and support that founded on theory. The sensing physical body enables the practice, through its presence, movement and the knowledge that resides in it. The body of the performer at the centre of the practice embodies concepts that inform the performance.

3.2.1 The performer and their embodied knowledge.

It is necessary to deal with ideas about *presence* and *encounter*, and how these terms effect the performer, audience and participant, in different performance contexts. In Simon Emmerson's book, 'Living Electronic Music', there is writing about the idea of presence in relation to its context and the entities that determine a musical performance event. Emmerson considers the association of these entities and the placing of them in proximity to each other as a case for their presence "..the given music (a priori), performer, performance, audience, time and place cannot so easily be separated" (Emmerson, 2007, p.30). The notion of presence with each other is implied in the listing of "venue, social milieu, performance, dissemination practice" (ibid., p.29). In my research, there is an attempt to develop this idea and understand what it means for the presence of the participants to be aware of others in the event, and to be engaged in an encounter. 'Encounter' represents the different agents in the work, being made aware of each other and to the musical work itself. It is also characterised by the spatial and temporal circumstances of performance.

3.2.2 The Performing Body

The performer occupies a space and activates it with performative activity, in a process of engagement with the components and conditions that inform it. The conditions also affect the performing body. The body is present at the centre of the performance, both occupying the space and engaging with the conditions that constitute it. The body, as a place for engagement, then embodies the practice; it takes place with the body. For Merleau-Ponty the body is the place of perception and the 'intentionality' of consciousness, he writes, 'a body embraces and constitutes the world' (Merleau-Ponty, 2012, p.239). The performer is present with their physical body, with a consciousness and perception, that resonates with the sensations in the performative space. Nancy, writes of the resounding space. He writes, 'it spreads in space, where it resounds while still resounding *in me'* (Nancy, J. L. *in* Born, 2015, p.22) He uses the term 'resounding' to refer to more than physical sound; it addresses the 'resounding' of an idea or thought.

The body also has awareness, mental perceptions and conditioning, that resonate in its consciousness mind. For Merleau-Ponty, the body is the place of perception, '..perceiving as we do with our body, the body is a natural self and, as it were, the subject of perception' (Merleau-Ponty, 2012, p.239). To extend his text; the body is the place where the world is present in perception and sensations; a body in the world and the world in the body. The body can be understood as a space that holds knowledge of the world and is engaged as it 'lives, speaks and produces' (Foucault,2007, p.383). In *The Order of Things,* Foucault, sets out the notion of the body 'opening up a space where movable coordinates' meet. It has been proposed in this thesis that the body is at the centre of the locus for performance, through its action, so the writing of Foucault gives some support for the coordinates that inform and govern the practices of the performer. Knowledge of the world, which includes the proximal environment, is available and embodied by the performer in the performative act. He goes on to state that 'in a general fashion, his corporeal existence interlaces him through and through with the rest of the living world' (ibid. p383). There is something here that reinforces the idea of the body of the performer being at the core of the action and thinking; that the act of performance manifests a body that is *entangled* with the world, to use a term from the writing of Chris Salter (Salter, 2010)

3.2.3 Embodiment

There is also a view where the knowledge is bound up in the physiology of the human body and the physical space it is in contact with; that the human body contains knowledge through its tactile and responsive position in physical space. Fischer-Lichte writes that 'the spectator experiences the performer and himself as embodied mind in a constant process of becoming'(*in* Giannachi, 2011, p16) which provides an acknowledgement of the audience in the performative event. This idea gives status to the audience, as being present in a relationship with the performer; it acknowledges the performer and a shared presence. In the 'process of becoming' the audience and performer have a presence at the event, experienced as embodied minds, and so encounter each other in this performative act. It is the notion that the location occupied by the presence of both audience and performer can be understood as containing knowledge that is useful here. It validates the presence of the subjects at the event in their physical presence to each other. Ideas concerning what it is to 'be present', to 'have a

presence', and 'to encounter', need to be addressed in order to substantiate the activity and participation in a performative event. The performer and the audience are present at the event; their presence is a factor for the realisation of performance.

The performative activities in this enquiry are concerned with musical performance, which engages the human body in a physiological coordination with a musical instrument. Fischer-Lichte continues, 'the mind is embodied and the body is 'en-minded' and gives the body the capacity to hold knowledge' (ibid.,p16). This notion of a connection and shared operation, regarding the placement of knowledge in both mind and body can be applied to the performer of a musical instrument. The control of the body in this coordination is governed by an experience and a knowledge that is built up over a long period of time. The physical and mental aspects are integrated to such an extent that the physical control can be understood as being directly connected to, and an extension of the mental processes. The human body is capable of memory, patterning and mapping through its networks of nervous system and muscle-memory. The physical body stores information and is an embodiment of knowledge about the performance action and location. The body is physically engaged with the performance activity; the body is moving as a part of the physical action with a musical instrument or sounding object. The body is moving within the confines of the physical space. If not actually making any contact with the physical boundaries, it is aware of the air and its movement, able to sense the temperature, to feel vibrations through physical objects.

3.2.4 The body and music

In this enquiry, the human body is constitutive of the place of performative activity, where consciousness, perception and sensation permit the possibility of production and engagement of the performance work. The body brings its consciousness, and perception allows for sensation, to quote Henri Bergson, 'my present consists in the consciousness I have of my body '(Bergson, 2014, p.155). The senses and the present are a 'single system of movements and sensations…quasi-instantaneous section affected by our perception in the flowing mass'(ibid.,p.156) and depend on perception as 'the seat of the sensori(sic)-phenomena' (ibid., p.161). Bergson's notion of the 'sensori-motor', that have 'attitude with regard to the impending future', reveals the idea of the body that contains both

'sensations and movements...at determined points of this extended body at a given moment ...a single system of movements and sensations'(ibid., p.156).

In the performative event, the conscious body moves and senses, in a state of conditioned embodiment, an agent that embodies and sites the practice. As performance, the extended movement moves forward in time, a 'continuity of becoming' that is the present moment for actions to 'be accomplished' (ibid., p.156). From Bourdieu, there is a proposal that the linking of practice to temporality resulted in a 'directionality'; that practice 'played out it time'. Bergson's 'becoming' gives this movement further direction as it establishes the moment of being in the present. The body engaged in practice is directed in time to the point of becoming, as it is informed through a perception of its movement and sensations, extending out to the boundaries of performative locus. Bergson's model of 'universal becoming' proposes a view of the individual and their relationship to the universe. The individual is seen as a cone, representing the individual's memory, with a point that moves across a plane of universal time. The point represents the individual at their present time moving forward across that plane (Bergson, 1929, p161). Bergson uses the image of a sharpened pencil drawing across a sheet of paper. In this model the terms *direction* and *becoming*, are closely aligned to the spatial and temporal factors of musical activity. The body, as it moves through time, creates the music in the space. The locus is not limited to the immediate physical domain of the performing body, as the site for perceptions, movement and sensations, but can stretch across multi-nodal performance environments that include networks and different forms of media.

3.3 Presence

There are two terms, *encounter* and *presence* that need to be addressed in some detail, in order to understand how topics such as *author/writer*, *community*, and *liveness* function in relation to the performer, as the possessor of performance knowledge. These terms form a key part in structuring the writing in the case-studies and need to be addressed as part of the methodology.

An idea to address is that of *presence*, as the state of being present and attentive to an event. The individual brings their attention to the event and is present to it. Bergson proposes that consciousness establishes the present as a factor of temporality, which gives

the idea that presence is characterised by a consciousness in the present moment. The perceptions and sensations also confirm the individual sense of presence in a space. In *Ecologies of Presence*, Gabriela Giannachi, proposes one view of presence as, 'being here, as and in environment'(Giannachi, G. et al., 2012, p13). The writing continues to describe the environmental integration that is accompanied by an awareness between the individual and their surroundings and, 'it is through the operation of presence that environments are generated' (ibid., p13). This writing locates an individual through their presence in the space.

In Giannachi's statement about 'being here' (ibid., p13), there is a connection to Heidegger's analysis of what it is 'to be', which is referenced here in its relation to the idea of *presence*. In his proposal that "to be" has evolved as an ontological term, there is, 'It is in being' means 'it persists in its presence...its persistence concerns and moves us' (Heidegger, 1971, p.95 *in* Giannachi, 2012, p10). Presence then defines how 'being' affects us, it confirms us. Presence is a condition of the subject in a temporal and spatial event.

3.3.1 Awareness in performance

Awareness is dependent on the use of perception and the senses. The use of *awareness* implies a sense of intention or motivation. Intention can be understood in the distinction between modes of perception, such as between looking and seeing, or hearing and listening. Thorne makes a distinction between the different modes when he writes 'hearing and listening represent two distinct phases of attention to the sounding world' in his thesis, *Ecologies of Sound* (Thorne, 2010, p.1). Awareness can be understood as a mode of perception made possible by a distinct phase of attention.

At the moment of awareness, then there is 'the continuous unfolding of the subject into what is other to it' (ibid., p13); the other becomes present. The deliberate turn involved in the subject having awareness is acknowledged in statements such as, 'I am in this place' and, 'I am in that place'(Mel Slater, *in* Giannachi, 2012, p.75). The subject is acknowledging the place in which they are present.

Nick Kaye, as a contributor to *Ecologies of Presence,* refers to presence as "a definition of the relationship between space and place" (ibid., p.60), which implies that it is the presence of a subject in a space that turns it into a place, the space is reconfigured by the attention of a subject. Marc Augé, *in* Non-Places(Augé, 2008, p.73), considers 'space' as a more abstract term than 'place', and describing it as an entity that can be adapted according to its function. Whereas 'place' is regulated by use and has an identity attached to it. An example from my practice could be a photo of the performer standing in front of a musical instrument. Augé refers to Michel de Certeau analysis of 'space' an 'an intersection of moving bodies', and transformable by a dynamic human presence (Certeau *in* Augé, 2008, p64). To consider *presence* in its relation to spatial concerns has some use for the understanding of the performer's action in the performance event. The presence of the performer in a space constructs a purpose and identity for its dimensions. The open space has become a place of performance through their presence. The location is then a condition of the performance locus, as it is transformed by the presence of the performer.

A view of *presence* offered by Giannachi, that lends itself to practices referred to in this chapter, and further chapters about networks and alternative sites for performance, is that, 'Presence is constituted in the complex network of relationships the subject establishes with the physical and/or digital world they inhabit' (Giannachi, G. et al., 2012, p50). The broader associations this makes, with performance sites as potential alternatives to the conventional music concert hall, gives an indication of the how the locus for musical performance has evolved. Before moving onto ideas about 'encounter', this quotation from *Performance and Place* emphasises the value of having a physical presence in *real* space and time. 'The cult event, real space, real experiences…Performance can be viewed as uniquely rooted to a place because it happens in shared time and space with its audience…….you really had to be there'(Hill, L. & Paris, H.,2006, p6)

3.3.2 Encounter

An understanding of how the participants can be present as individuals and coming together collectively in the performance is useful when considering the different participatory structures for performance. In chapters 6 and 8, there are case-study specific analyses of the idea of community in regards to musical performance. The purpose of the

writing here is to understand in what sense the individual comes to be part of that community; what they bring with them as they attend to the performance.

At this point, the enquiry is addressing the nature of performance as it is constituted by its participants, whether they are active as soloists or collectively. The idea that an individual has a presence and is present in the performative configuration means that they can be aware of and choose to acknowledge other presences. The configuration or number of individuals is dependent on other factors, as discussed elsewhere, with the possibility of one individual being present at their own performance. To engage in some form of interaction the individual needs to be able to acknowledge and communicate with others, and the term *encounter* serves as a way of understanding that contact. A dictionary definition gives 'A meeting face to face' (OED, 2019) and has a combative sense of one against another, but here it is nuanced towards a musical encounter and musical production. The term 'encounter' is applied to contact between subjects to enable musical exchange. It is also applied to contact with the work itself; they encounter the musical work and its actions.

How then do the ideas around *presence* and *present* contribute to an understanding of *encounter* and *community*? Before the enquiry deals with configurations of performer/audience, connection and communication, there needs to be some understanding of the status of these agents and agencies as coming to a collective activity, in place and time. The notion of the 'sensori-motor', from Bergson, proposes that the sensations and movement constitute the present moment and the 'actual state of becoming' (Bergson, 2014, p.156). It is possible to extend this concept, that consciousness, perception and sensation are factors of the performer's presence, to include factors concerning the context in which the individual is situated; that it concerns other performers and participants present in the work and its context. There is even the possibility of a collective 'becoming', as individual sensory presences are grouped into a collective body. The notion of a collective body forms part of a discussion about community in Chapter 8, with the idea of a sensory-based community proposed by Ranciére, a 'community of interest' (Emmerson,1989, p.142), and others. The chapter also deals with the notion that *presence* and *encounter* are not limited to the immediate environment, that these dimensions can constitute the performative act across distant and

remote networks. The idea of a collective presence as part of the identity of the *community*, is concerned with an acknowledgment made by the individual of the other presences in the encounter. They are collectively present to each other and the work. The term 'encounter' could also be applied to the idea of a collective presence. They all come together in a performative encounter that establishes a *community* of individual presence in the performance. The terms *presence*, *present*, *embodiment* and *encounter* appear and inform the discourse within many of the case-studies. These terms also help us to understand the changing role of the audience, as participants in the event.

3.3.3 Audience and Performer

In a review of the relationship between the performer and audience, it was evident that there is not yet an extensive body of critical writing that deals with a changed notion of the dynamic of the audience/performer. Research has focussed on how the performer and audience engage with each other, but not found a way to think about other possible integrations with participants in other creative roles. Later, there is a review of ideas found in theatre studies, as there is an extensive literature critiquing the performer/audience relationship. In musical performance, the language tends to refer to the two sides of a performance event, with the performer attempting to find new ways to stimulate some engagement from the receiving audience. Some research has looked at how each of the agents in a performance can modify their behaviour but they are still considered in their position on or off of the concert platform. John Sloboda has written about possible new strategies for more engagement with the audience, such as creating more intimate performance settings and allowing audience feedback. The research paper suggests that 'this make concerts more unpredictable and new, more personal, and more active. And that's what today's audiences want '(Sloboda, 2013, p.17). This seems to perpetuate the idea of *them and us,* and the artist delivering the performance to a receptive audience. Earlier in the paper the research mentions that the audience liked small events, where they felt the intimacy of the space and a closeness to the actions of the performer. This is confirmed, in my experience, by the success of venues such as Café Oto, London[14] that hold quite small and intimate audiences. The performers are on the same floor and amongst the tables of the café. There is always a crowd, that is knowledgeable about who

[14] https://www.cafeoto.co.uk

and what they are going to hear. It also connects with a large social media network that fills out the background on the event. These ideas, concerning the relationship between performance and community are the focus of case-studies in Chapter 7.

3.4 Projects, Chapters and Documentation.

The research methods operate within four main projects, producing materials that are analysed and used as evidence. The projects serve as case studies undertaken during the period of this research and dealt with in chapters titled, *Evolving Practices*, *Community, Technology* and *Architectural Spaces* .

In Chapter 4, historical case-studies are taken from different periods of my musical career and used to support the research. The distribution of these across a period going back to the 1970s, contributes to the idea that the locus for performance has been changing for a number of decades.

Documentation of the practical work for each project is accessible as audio-recordings, film works, and documentary media in Appendix 1 and via links to web-based materials, given at the start to each case study.

3.5 Case Studies

In a discussion about the urban phenomenon, Lefebvre suggests that a 'radical critique can define a methodological and theoretic *relativism*, an epistemological pluralism'(Lefebvre, 2003, p.66) which affects provisional theoretical and practical models. This 'pluralism' offers a useful approach to understanding the relationship between the multiple dimensions of the performance locus. Lefebvre offers a critical approach that is relativistic. It considers the possibility of a locus where different ideas and practices can be understood in their relationship to each other. As a critical term it gives reinforcement to the concept of a theoretical and practical locus characterised by its multiple contents and structures. Lefebvre's proposal that 'no method can ensure absolute *scientificity*, whether theoretical or practical' (ibid., p.66) is a useful way to understand the relativistic nature of many of the components of the locus. This approach is adopted in the enquiry in later

chapters to support arguments for a new understanding of operations between components of the locus or even the case for relational loci.

3.6 Methodologies for a Multivalent Space

It is necessary to acknowledge the complex nature of performative activity. This topic was addressed in the Introduction and has consequences for the choice of methodological approach. Schechner has produced a number of diagrammatical aids that help to illustrate the multivalent nature of performance (Schechner, 2006, p.17). While used by Schechner in discussing theatre, the diagram (Fig.3.1) might serve to set out the relevant dimensions of musical performance. Since the 1960s, Schechner's writing has developed theories in the context of theatre studies, extending them as the term 'performance' has been adopted in other contexts. His ideas have been used, where they support a determination of the locus (Schechner, 2006). I have used diagrams and tables to articulate the relationship between the different domains of *practice, technology* and *community*. It is useful to visualise terms in relation to each other; the abstract notion of locus can be understood as a space not only defined by mathematical dimensions, such as physical distance and proximity, but as a product of thought, consensus, and creative action.

Fig.3.1

Performance Fan. (Schechner, 2006, p.17)

3.6.1 Adaptation

It is necessary to acknowledge the role of adaptation in the multi-layered and multivalent concept of performative locus, as its dimensions have developed or morphed to meet new cultural and technological circumstances. This adaptation has meant that the nature of performance itself has changed, making it even harder to identify. As the locus

has changed, so has the nature of performance. McNamara and Schechner give some idea of these changes.

> *Performance is no longer easy to define or locate: the concept and structure has spread all over the place. It is ethnic and intercultural, historical and ahistorical, aesthetic and ritual, sociological and political. Performance is a mode of behaviour, an approach to experience; it is play, sport, aesthetics, popular entertainments, experimental theatre, and more. (Schechner and McNamara, 1977, p.215)*

3.6.2 Work Spaces - Studio - Performance Site

The process of finding workable methodologies was arrived at through a number of strategies, each operating in different locations: the physical spaces of rehearsal studio and performance site for the activity with instruments, sounds and scores; the physical spaces of libraries and reading desk for reading texts and taking notes; a third space accessed through the computer interface, both physically present and connected to cyberspace.[15] We will use the terms studio, performance-site and cyberspace to refer reductively to these rich and complex environments. Although real enough for most of the work, the terms are also placeholders for spaces that function under them: a studio space is the place where studio work takes place; a performance-site is wherever there is performance; cyberspace is accessed from any interface.

Fig. 3.2

Washing line , holding theoretical texts in the same space as the creative musical practice. 2014- 2016

[15] As Stephen Johnson writes 'for all practical purposes, invisible, outside our perceptual grasp. Our only access to this parallel universe of zeros and ones runs through the conduit of the computer interface.'(Johnson, 1997, p.19)

Initially, this arrangement enabled investigation into dimensions that informed the activities in distinct locations. It was possible to work with concepts that were specific to each environment; physical conditions such as performing technique or proximal logistics for instruments in the studio, pursuing theoretical ideas in texts, and connecting with software designers via the Internet. The boundaries between the spaces were often crossed, and necessarily so, as pieces of texts, performing activities, and computer programming were incorporated across the works. A key dimension of the locus is the performance environment itself, which is not necessarily limited to a specific physical location. An important aspect of the transformation of the locus is the opportunity for different points of access and distribution, where the work emerges. This topic appears in many of the case-studies where it is investigated in context.

3.6.3 Interrupted Practice

There were phases to the research that required a change of approach, as critical viewpoints became clearer. Initially, the work was a process of trying to match performative activity with theoretical ideas; a case of doing something and asking questions about what was happening or what informed the activity. The research developed from ideas suggested by questions and challenges arising in the engagement of practice and theory; often a process of interruption - stopping one activity to do another. The process worked in both directions; practice to theory and vice versa. This developed into more concrete methodologies able to expose the thinking, through practice-based testing of theory and theory-driven practice.

3.6.4 Reading posters – spatial context for selected texts

In order to keep the theoretical research in contact with the practical, various methods were used, such as the washing-line shown in Fig.3.2. This process was developed further with the making of large posters that had specific collections of relevant annotations. These are collected under topics and writers, with the selection of the texts representing a process of suitability and testing against the practical context (Appendix 2 Technical - Posters). These were placed around the studio space and were an attempt to

locate ideas into the physical space of the music practice (see Fig.3.3). This visual representation of thought is similar to the idea of the memory devices described in *The Art of Memory* (Yates, 1992), where information is deliberately linked to a visual object or physical location to aid recall. The connection established between the entities is assisted by the ability of the mind to place the linked information in an internalised mapping of the physical space. I found that placing the research texts on posters near the instruments helped me sustain the ideas as I moved between the practice and the texts. My focus could move between them as sound was made, allowing me to find any associations.

Fig. 3.3 Vibraphone with large posters

3.6.5 Observing - Playing- Testing

In the studio, it was a case of observing what would arise at the point of making work. This might consist of taking musical material and working on it at a musical instrument or simply trying different techniques to make sounds. Although these actions might seem to constitute the fundamental process of preparation, they are rarely informed by any thought or intention about the purpose or context of the performance. There are questions within these initial musical activities. This first moment is important in that it immediately confronts the performer with choices and the need to find a basis for decisions. What is happening and what is it for? In trying to establish a context for it, where does it take place? Surely, in the physical space - the studio or performance site - but also in the mind and body of the performer and any person engaged with the activity as listener, collaborator or composer. It takes place in the media used to communicate between these participants, so any understanding of the performance context expands to

the instructions of the composer, the score, and the many ways that sound can be distributed.

3.7 Around Modalities.

The practical environment that contains the performance is a space informed by knowledge. Foucault has proposed some ideas that offer a method for structuring observations. His 'modalities of order' as a method for setting out knowledge, offers a way to organise and relate the knowledge to space and time. It links the knowledge to concepts supporting other dimensions of the 'locus', as the space of thought with, 'modalities of order have been recognized, posited, linked with space and time, in order to create the positive basis of knowledge'(Foucault, 1989, p.xxiii). In this, there is the notion of ordering and associating ideas observed in the performance locus through a process of using modalities.

The context for the performance activity was determined by the physical space, the technical skills of the performer, the compositional process and the medium it occupied. These entities provided some useful modalities that align with parameters outlined in the Introduction. These modalities centered on: performance environment; the skills of the performer; the nature of the score; distribution.

As the research proceeded, these modalities became more refined and provided a sharper focus to the investigation. Key perspectives emerged as common threads through the process: authorship/collaboration; physical/virtual space, social/cultural contexts, temporality/place; distribution/collective-individual. These perspectives could then be used as a methodology to apply to collection of questions and responses arising from the practice.

Let us consider how questions around the understanding of a dimension such as sound can develop into useful discourse, by looking at a generalised, paradigmatic instance of my practice-based research process. The intention here is to demonstrate how key moments in the practical activity triggered questions that led to the identification of modalities.

> *I stand at a sounding instrument and strike it to produce a sound. How do I understand what is happening? The sound produced is a key component of the practical activity. Here the term 'sound' is presented as a phenomenon of the senses, hearing and otherwise, as a corporeal experience, using the 'transfer of energies' (Borwick,1987, p.20) As I play the instrument, it provides materials, as sound-objects, taken up in the process of composition, to become components of an organisation dealing with their codification and the performance that deals with them. (Limbrick, 2014)*

The action of making a sound, or deciding not to, was challenged. In some instances this involved writing a question on a 'Post-It Note' and placing it on the instrument. In this case the question was, 'What has this action got to do with a performance?' To proceed with any activity on the instrument, the question had to be dealt with. The question would be noted and further paths for inquiry developed around the action and its relation to performance. Some questions led to ideas concerned with the determinacy of making any work, about production, and the perception of it as a work - both physically as sound, and as some kind of score. Others led to research into the boundaries of performance: What constitutes performance? Where does it start and end? In what ways do the score, physical space or attitude of the performer define the boundaries? Here I call on ideas from the field of Theatre Studies (Pearson, 2010, Schechner, 2006, and Carlson, 2004 et al.). Looking at the discourse within Performance Art and Situational Art, with texts by Kwon, Doherty, and Compte, provided useful perspectives (Kwon, 2004, Doherty, 2004, Huxley et al, 2002). Although from different disciplines, these texts enabled discourse in the practical space, allowing a dialogue to take place between practice and theory. Thoughts around the idea of determinacy in music are explored in the writings of Cage, Cardew and Boulez. (Cage, 2009, Cardew, 1971, Goldman, 2011). These discourses were assessed in their potential to articulate a notion of locus in new music performance. The texts relating to these ideas were literally in front of the instrument, to be retrieved or placed there according to their suitability for understanding and articulating the practice.

3.7.1 Post It Notes - Critical Terms.

Having identified terms and modalities, the next phase in methodological development was to find a suitable method for testing and comparing responses coming from the practice. From a process of applying concepts found through a generalised scoping of the literature and challenging practical activities in the making of work in the studio, the research moved to addressing the work through a number of headings suggested by the work itself. The perspectives that revealed themselves as common threads through the work could be used as headings under which to place ideas that arose during the practice.

These modalities are at the top of the table set out below, with responses from the practical and theoretical work listed as topics underneath them (see Fig. 3.4). By a process of capturing the challenges and responses in the practical work and then identifying where to place them in it, a methodology was established that used the modalities to view the work: a method working under the headings. In this thesis, each case-study addresses one of these modalities, which have been set out in the table below. They serve as rubrics under which different topics and parameters can be grouped. The different topics sometimes appear in more than one place, as they relate to more than one modality. This repetition across different modalities reveals connections and relationships between them.

Authorship/Collaboration	*Physical/Virtual Space*	*Social/Cultural contexts*	*Temporality/Place*	*Distribution - Collective- Individual*
	liveness	liveness	technique	liveness
ownership	ownership	ownership	process	ownership
Instrument design	CD	community	interface	community
improvisation	instrument	education	building	internet
collaboration	open-sourced	technology	score	communication
technique	digitisation		composition	

Fig. 3.4 Headings and Modalities

3.7.2 Perspectives, Modalities

The headings were used as vantage points from which to investigate the performative locus. Each opened up areas of theory and practice that related to a subject, sometimes under more than one heading. For instance, *architecture* appears in most of them; other examples include *embodiment, network,* and *distribution*. To be clear, the words populating the table are part of a dynamic configuration, meaning that they are relative and not fixed or mathematically located. As new questions, responses and key words come out of the practical work they are put under one or other heading in the table. The headings in combination with the words underneath them imply a subject for investigation. Other topics might also come from the different areas of theory that are being addressed. It is a taxonomy filled with cross-referenced topics. Looking at the table above, it's possible to see 'open-sourced' under 'physical/virtual space, as the result of shared or communal practice. What can be understood by 'open-sourced physical/virtual space'? This enquiry leads to areas of investigation that include the discourses around public buildings and access, networking through different media, and the possibility of open participation in the 'space' of a musical score. All three provide key perspectives with which to understand the performative locus, even if they were nuanced to just architecture, the Internet and improvisation.

3.7.3 Re-occurring Ideas

The repeated appearance of these ideas under different headings also produced the next stage in the work. The common ideas could be linked as areas for theoretical discourse. The term *community* appears frequently, as it is associated with different headings. This frequency brings it to the fore, as a subject that is stronger than others, and it merits further investigation. It appears to have an impact on a number of the dimensions informing the locus. Other ideas that appear in a similar way are technology, ownership and performance skill. The methodology here uses a process of evaluating the table from a distance; as these ideas dominate across the table they become new headings. A restructuring of the table suggests that the dimensions of the locus could be viewed from the perspectives of practice, technology and community. The setting out of the materials creates a situation where it is possible to discover localised connections and also get an overview as commonalities become evident.

3.7.4 Shifting Relationships

The dynamic quality of the visualisation in the table allows for things to change and the possibility of observing the relationship between the different dimensions. Their dynamic and relational properties result in a complex assembly of energies. Although it is possible to find explanations in the form of theories or practical evidence for different parameters and dimensions, the relational ideas become difficult to observe. It is at this juncture between all of the identifiable layers of activity, where the different conditions of the performance locus interact, that there is change. Each condition determining the locus has developed within its own domain – architecture, technology, cultural context, 'score' etc, with details appearing as necessary in the case-study chapters - but the significant evolution is that the relationship between them has shifted, or rather is shifting in ways that are yet to be understood. The idea that the 'where' of performance could be shaped by a combination of relational conditions brings the possibility that the locus is not a singular context but the shared space of many loci, each overlaid or entangled at the moment of performance.

3.8 Practice Technology Community

> *No ear, no piece of apparatus could grasp this whole, this flux of metallic and carnal bodies. In order to grasp the rhythms, a bit at time, a sort of meditation on time, the city, people, is required.(Lefebvre, 2003, p.39)*

This quotation from Lefebvre, continuing the idea of urban street as a metaphor, gives some idea of the difficulty of getting a sense of the whole view because so much is happening. The dominant idea is of a volatile shift between all the parts, moving like liquid, with no fixed rules for its objects. The three headings, *practice*, *technology* and *community* were selected because of their popularity across the modalities and their capacity to contain the range of ideas, parameters and conditions. The headings break down into their constitutive conditions and components.

3.9 Performance Model

For the purposes of developing this methodology it is useful to see the headings work. The figure below is created around an image from one of my performances. The high angle of the photograph conveys a sense of the scale of the performance space and there are visible performative materials around it. The venue doesn't look like a conventional music concert hall – it is a theatre.

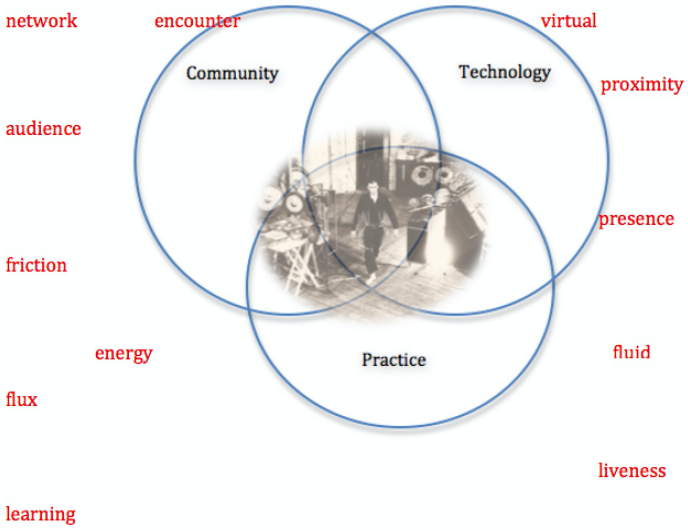

Fig. 3.5 Applying terms and headings .'One Small Step, Almeida Theatre', 1987.

There is some sense of movement with the walking figure at the centre. The image has three circles with the terms, *Practice, Technology* and *Community* clearly written. Ideally, the image would be better as a three-dimensional model with three spheres. These represents the locus and its dimensions, some of which become clearer as I look at it from the perspective of each of the headings. There are words scattered around the image, taken from a more comprehensive version of the table above. In the *community* sphere they can be used to understand the ideas of community, as they are connected with it. The pulling together of *proximity*, *liveness* and *community* opens the way to a discourse about the relationship between these concepts. If the words had been, *network, encounter* and *community*, an entirely different discourse ensues. Taking a view at the *technology* sphere, produces another way of understanding the ideas about *audience* and *learning*. Additional terms under *technology,* such as *authorship* and *virtuosity*, bring the focus to issues that are prevalent in the new digital age. In each case this process takes the work in this thesis

towards a way of understanding the significant changes that are affecting the performance of new music.

The idea that the locus could be thought of as a three-dimensional form gives a sense of it as occupying a space, not just in its physical dimension but also as a container of knowledge. In *The Production of Space,* Lefebvre has described different types of spaces - urban, agricultural and architectural - with the purpose of using them as virtual spaces to be filled with concepts, using them as a way to theorise and deal with ideas about real objects (Lefebvre, 2003, p.23). This can be a way of understanding the locus of performance as a site of knowledge that is manifested through the embodied practice of the performer. I would like to elaborate the idea of the multi-dimensional quality of the locus by using some other ideas about how it might be understood.

3.10 Spatial Factors

Tim Ingold uses the idea of a sphere of engagement created by the knowledge that is made by sound in an acoustic space around the listener. Its boundary only exists for as long as there is sound, giving it an ephemeral quality of having 'no outer surface or boundary', as the sound intensity goes away to silence (Ingold, 2000, p.249). This idea gives a sense of an invisible knowledge that occupies a space in dimensions we can only hear. It helps to understand how a space that cannot be easily perceived still has the capacity to inform. Other ideas about the performative locus from the disciplines of Site-Specific and Theatre practices can also help to understand the dimensions of the locus, through its context and demarcation. Miwon Kwon writes, "our understanding of site has shifted from a fixed, physical location to somewhere or something constituted through social, economic, cultural and political processes." and " from a physical location – grounded, fixed, actual – to a discursive vector – ungrounded, fluid, virtual."(Kwon, 2004, p.10). Fluid or liquid metaphors appear often in this thesis, as ways to describe the movement and energy of shifting cultural ideas. Mike Pearson proposes the idea of *brackets activity* to define the entry and exit points into a notional performance space that could be constructed physically (stepping into and establishing the physical performance) and mentally (getting into 'character' or mentally engaging with the performance act)(Pearson,2010,p.141). Using Pearson's idea, the boundary to performative locus is wherever someone decides it to be, which could be distanced physically, technologically

or temporally. These notions of how to define the locus as an entity constructed by knowledge support the sense of a location manifested by the act of performance.

3.10.1 Shifting Strata

With this framework in place it is possible to consider some further paths for investigation. The shift in the relationships between dimensions of the locus can have a large impact on others, thus distorting the entire performance locus. If one of the subjects taken from the main three headings develops at a different rate, what impact does that have on the whole structure? An example might be that funding for live performance is dramatically reduced, so that venues are unable to promote live music performance. Another example could be that the number of large mixed-media productions are restricted by their ability to find suitable rehearsal spaces. A third example is that the technologies of the Internet become developed enough to allow high quality broadcasts of performance activities to replace live physically located performances. These examples are not imagined but are features of the context for new music in the current time (2021). I have outlined three areas where there is evidence of change. There is enough evidence even in this brief text to identify that there are differences in the way they are developing. The locus for performance is dependent on how the relationships between these dimensions function. Each of them is developing at a different rate, and they sometimes share factors that bring about that development, such as technology which features in all of them. The shifting and disconnection evident in these relational changes is one of the key areas for investigation. There is the idea of *hysteresis* that Bourdieu suggests as a possibility with his conceptual model of practice. In outline, he proposes that *practice* is the result of a configuration of what he calls *habitus*, c*apital* and *field* (Bourdieu, 1977, p.214). Although there is much behind this concept, it is enough to interpret these as *disposition*, *resources* and *environment* respectively. Bourdieu refers to the relationship between the disposition and resources parts as being like, ‘a fish in water’, where *habitus* and *field* are well matched (Cheryl Hardy *in* Pierre Bourdieu, Key Concepts, 2008, p.126). The idea of *hysteresis* refers to the situation when one of these elements is no longer in synchronisation, that their relationship has shifted and has to adjust. Key factors in this adjustment are that it takes a period of time to adjust and that those best placed in terms of resources have the advantage in the recovery rate. It is possible to see how the three

areas outlined below can be shifted time and resources, and that this *hysteresis* can lead to an evolved notion of the locus for the music performance.

Applying this idea of *hysteresis* to the dimensions below, it is possible to understand that as they adjust there is a difficulty in their integration into a larger configuration. Any condition or dimension that is configured by this integration will struggle to operate in the larger field of operation. To use the model by Bourdieu, there will be a disconnection with the *field* and difficulty with the practice as a result. The *field* in this research is that of the cultural practice of producing musical performance.

There are ideas here that test the methodological process, with the intention that these might be dealt with in the workings of the case-studies and my conclusion. Ideas provoked by this method might provide materials for a new way of thinking about a performative locus; a revised model, based on current conditions, that allows for the practice and performance of new music in the future.

3.11 Three Dimensions

1. The magnet of technology

Many different technologies are engaged in the locus of performance; including audio, visual, architectural, instrumental, communications, distributive and copyright. The rate of the digital development has been rapidly increasing for twenty years and we are apparently at the beginning of it still. It is clearly having an impact on the performing arts. The challenge in this research is to apply the methodologies that address the relational shift between informative conditions and understand the impact of a reconfigured locus.

2. The role of the performer

The performer is no longer concerned only with the conventional paradigms of virtuosity and instrumental skill. The role now encompasses compositional, collaborative, improvisational, educational and technological skills. How will these dimensions develop further and what is the impact on more conventional configurations of creating new music still based on the task being distinctly allocated to individual specialists?

3. The Creative Community

The rise of community and education based practice has started to create a situation where there is more new music being created in collective community environments than in specialised music performance environments. Much more new music performance is taking place away from the conventional concert halls and arts complexes. By working through notions of the redistributed 'site' of new music and exploring how this operates in relation to other dimensions of the performance locus, a new understanding could be arrived at for the development of the art form.

These last three provocations expose tensions that will appear within the case studies.

4 Historical Case Studies

My musical activities started around the early 1970s, with guitar, piano and drum lessons. I was fortunate enough to have some excellent teachers, such as Trevor Tomkins on the drum-kit, and Howard Rees for Music Theory and Composition, as well as a flourishing school music department run by Audrey Clifford. I am indebted to these people for the start they gave me. It meant I was prepared for the performances and experiences for my teenage years, and able to appreciate the wide range of music that I discovered. My early performing experiences also meant that I had some awareness of the different aesthetic and performative contexts for the music.

In the 1970s, artists of different disciplines from across the world were starting to appear more frequently in the UK, as my study of music intensified. I was able to attend performances by artists such as the Steve Reich Ensemble(1973), Les Percussions de Strasbourg (1974), Stockhausen (1977), Gary Burton (1978), Keith Jarrett (1978), Mike Gibbs (1980), all at the Roundhouse, Camden, London. African musicians were living and performing in London, so I also heard artists such as Jabula (1975), Taxi Pata Pata (1984), and fusions with jazz such as Trevor Watt's Moiré Music Drum Orchestra (1978).

I managed to catch performances by Derek Bailey's Company and the London Musician's Collective. I had also started to record and edit sound with analogue recording tapes, usually cassette format, as I had seen done at the Cockpit Electronic Music events. This selection from my musical activities gives some idea of the breadth of my curiosity; I'm not sure if I understood much of it. This didn't prevent me from taking the opportunity of giving a short lecture to my entire secondary school on my understanding of Stockhausen's *Gesang der Jünglinge (1956)*, with musical excerpts and my views on the future of music.

Whilst studying at the Royal College of Music (1976-79) I discovered the Electronic Music Studio, then run by Lawrence Casserley, and started to integrate electronic elements into my creative output. By using different types of microphone, arrangements of sound-speakers and various processors like tape-loops, it was possible to transform the

performance spaces and realize new relationships between audience, performer and performance site..

4.1 Solo Performance

A key moment was a solo show that I took to the Edinburgh Fringe Festival in 1982. It featured a mix of sound diffusion, film, choreography and theatre. The performance works incorporated physical movement, skills that were supported by my participating in ballet classes at the London School of Contemporary Dance, The Place, London (1979-1982). They also used structural elements of the buildings themselves, such as floors, walls and windows, with microphones and recordings used to incorporate the external sonic environment beyond the immediate performance environment. Other performances in this period also took place in Art galleries, like the Acme Gallery (1982), the ICA (1981), Chapter Arts Centre, Cardiff (1982), Tower Hamlets Community Halls (1979-1983), Shoreditch Park, London (1982).

I witnessed a different approach to sound-making, with devices and techniques contributing to early Sound Art, when David Toop and Max Eastley whirled microphones, bull-roarers and cymbals around the space at the London Musicians' Collective (1978) , The Air Gallery (1982) and the Acme Gallery (1981), London. I also listened to the work of these artists from recordings released on Brian Eno's Obscure Records Label (1975). In contemporary music, sound technologies established a new way of balancing instrumental sounds, mixing amplified instruments with acoustic sounds in a way described as 'sound reinforcement', the art of subtly amplifying within an acoustic performance environment as provided by John Whiting[16], Lawrence Casserley[17] and others. I bought my first eight channel sound mixer and built sound systems from scratch in 1979, in order to experiment with and access sonic diffusion possibilities across the range of performance activities.

[16] October Sound, London.

[17] Director, Electronic Music Studio, Royal College of Music.

Performing, composing and managing rock bands occupied a substantial part of my later teenage years as I contributed to a range of musical contexts, performing in Punk and Pop bands at major London venues, such as Music Machine and The Nashville, London. In the early 1980s, from my experiences of visiting artists, I could see that free-improvisation, electronic, American Art music and site-specific work were better established outside the UK.

4.1.1 Multi-skilled musician

In 1981, as a performer and composer, I made pieces for community spaces in the East End of London and contributed to shows by fringe theatre companies for unconventional performance spaces, that included libraries, cinemas and a bus station. I started to work with the New Arts Consort, directed by Charlie Barber and based in Cardiff, Wales. The performances often presented the musical program in combination with other media and were situated in a range of spaces outside the conventional concert hall. Production rehearsals took place in a disused school, that had become a centre for artists working in a broad spectrum of performing arts practices, known as Chapter Arts Centre. The building was occupied by groups of artists and performers who operated in various overlapping and independent modes that were experimental, multi-media and often politically motivated. Much of the Centre's output featured at alternative performance sites throughout Wales and mixed-media production. It was impossible not to be aware of the agenda: a cross between an art school and an agitprop[18] scrapyard. This kind of working environment seemed to go hand-in-hand with certain forms of music-making that could be made with new arrangements of instruments and an open attitude to the compositional input, producing a musical hybrid that mixed musical styles, sounds and disciplines.

Homemade electronic or 'junk' instruments could be used. I frequently had to store quantities of 'found' objects and 'junk' instruments for use in performances or community projects. Much of the work depended on the compositional input of the performers, contributing as improvisers and arrangers, a common practice in the projects in which I

[18] agitation and propaganda, art forms with an explicitly political message.

participated in Italy, Brussels and Holland. It was similar to methods used by other musical projects I had become involved with, including The Lost Jockey[19], the Royal National Theatre and contemporary ballet companies.

The places in which the music was being made formed part of the musical identity, in much the same as the classical concert hall or the pub venue contributed to their programming. In the 1980s, it was possible to participate with and see groups like 'Urban Sax',[20] 'Bow Gamelan'[21]and 'Test Department'[22], who performed in large public spaces and often in ways that were specific to the site. The working methods of these groups were similar to others I have experienced or been involved with like 'Dogtroep'[23] in Amsterdam or 'Einstürzende Neubauten'[24] in Berlin. Many of my solo performances made use of materials specific to the location, the walls, the floor, the resonance of the space, bringing in the exterior world with resonating tubes suspended out of windows, tape loops set across the back yard of a block of flats, recorded walks around disused sites. I collaborated with composers to produce musical materials in a way that countered my experiences with the performances of highly notated contemporary scores like James Dillon's 'TiReTiKeDha'[25] (Dillon, 1978) or Luciano Berio's 'Linea' (*Berio,* 1973). My role as a contributor to the field of Contemporary music was no longer bound to the programming of the major art institutions and the conventions of the concert hall. I performed in different kinds of spaces, alternatives to the established musical environments; places such as Art galleries, factories, disused buildings, rooftops and cinemas.

[19] Lost Jockey; a large ensemble that started its musical trajectory with the first UK-based performances of early works by Steve Reich and Philip Glass and went on to produce a large collection of original output.

[20] Urban Sax. http://urbansax.com (accessed 3/5/2017)

[21] Bow Gamelan. http://www.annebean.net/past-projects/1981-1990/192 (accessed 10/3/2016)

[22] Test Department. http://testdept.org.uk (accessed 3/5/2017)

[23] Dogtroep. https://nl.wikipedia.org/wiki/Dogtroep (accessed 3/5/2017)

[24] EInstürzende Neubauten .https://neubauten.org/en/biography (accessed 4/5/2017)

[25] First performed April 1982, South Bank Centre London by Simon Limbrick

4.2 New environments

Working in Italy allowed me to develop my practice, including community-based projects and solo performing. It also showed me a broader approach to music-making that was different to the UK at that time (1982-84). I found a different context abroad for thinking and creating work for different kinds of spaces. There was a more receptive attitude to the possibility of alternative modes and spaces for performance. It is an attitude that I find still exists in the current time (2020s), with audiences, locations, social integration, and funding for the arts creating a different environment for artistic practice outside the UK. My connections and practice with artists in countries like the Netherlands, Denmark, Germany and Italy continues to nourish the creativity of new music practices.

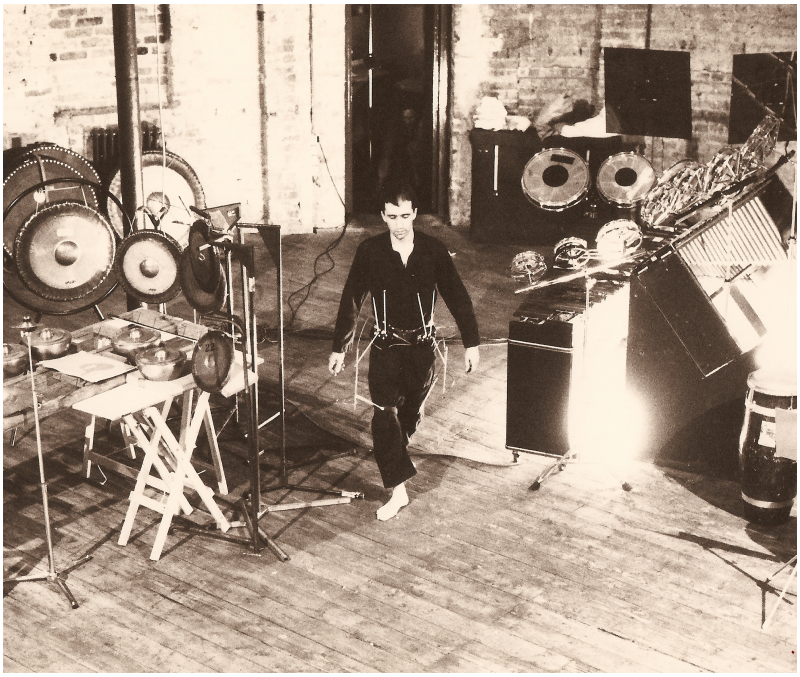

Fig. 4.1 Performance 'One Small Step' Spink/Limbrick , Almeida Theatre, 1987.
Photo: James Barrington

As a soloist, I had started to integrate many of the different skills and experiences gained over the previous years into my performances. The practice included percussion performance, music technologies, movement, and visual strategies. My work with mixed-media formats, using film projection and dance became a feature in my repertoire. The image in Fig. 4.1, is of a setup that incorporates two large percussion works, 'Cinq Chanson'(Vivier, !980, 1st UK Perf.), 'Elvis Revenged' (Poppy, 1987, 1st Perf.) which includes a TR808 drum-machine, and 'One Small Step'(Spink/Limbrick, 1987, 1st Perf.) for movement and electronic triggers.

The image also shows that theatre lighting is a feature of the performance. Live multi-tracking was also used to layer the performance of 'TiReTiKeDha' (Dillon, 1978). There are many details present in this image that connect with the ideas discussed in this research. The document helps to articulate how these ideas could inform the dimensions of an evolving performance space. The image and the event pre-dates the possibility of integration with the Internet, but that becomes a possibility a decade later, as Internet connectivity becomes viable. Chapter 8 is focused on the cyber-network context and the implications for an evolved notion of the performance, as a performer and audience participate as a community.

A key work that I used in some of my community-based work abroad and in the UK, was revisited during the Telegraph Hill Community Festival, London (1998), was 'Tribadabum extensive sur rythme phantôme' by Vinko Globokar (Globokar, 1981). Originally composed for a performance in 1981, three performers lead the audience, in the first performance standing in three roads leading off a town square, playing car keys and other small found objects, to jointly create a mass musical extravaganza. Paper is torn up, ping-pong balls fly around and there is a lot of sound-making from the audience. A piece that makes participants of the audience and a performance location out of the space they occupy. The ideas of performer leadership, structured improvisation and audience engagement were similar to those I was developing in my own work. I have composed pieces for the mixed abilities of young musicians, so that performances were more like social occasions, even with dialogue and food. The impact of working within this freedom has had a lasting effect on how and where I work.

Back in London, a musical venture that had a distinct performance experience for me was the production of Aeschylus' 'Oresteia'(1981) [26], music by Sir Harrison Birtwistle, at the Royal National Theatre. The production of Aeschylus' 'Oresteia Trilogy' lasted four and a half hours in the Olivier Theatre, a space modeled on the proportions of an ancient Greek theatre. A model of a performance space that had a historical cultural context and a social purpose. The music accompanied and intertwined with the spoken word for the

[26] http://catalogue.nationaltheatre.org.uk/CalmView/Record.aspx?src=CalmView.Performance&id=513 (Accessed 15/7/2016)

duration. Much of the initial rhythm work was worked out through improvisation in the rehearsals, alongside the actors, and directed by Birtwistle. This is also matched the experimentation with newly constructed instruments. This work was generated out of a part-improvised rehearsal process where individual materials were crafted and filtered in order to create the larger work: a process familiar to me from other performing contexts.

The sounds, tempo and instrumentation were selected to work in the context of a large theatre space that didn't follow the convention of a proscenium arch or end-on concert platform. It was found that no amplification was needed, when the production transferred to the outdoor theatre at Epidaurus, Greece. Despite the larger outdoor space, and the sounds of the production, both spoken and played on instruments, carried to the back of the 14,000 seat auditorium. The choice of musical instruments and the relationship of the musical materials (e.g. simple slow pulses, baroque clarinets and text derived meters and punctuations) had anticipated the physical space. The artistic aspects of the allegorical and metaphorical nature of Aeschylus' text were underscored and exposed with the mechanics of the sound production. The sounds of Apollo's harp and the shrieking of the Furies alongside the brutal jarring of metal on metal that matched a plain-speaking translation, by the poet Tony Harrison, into the social space of the audience. This production took many years to come to fruition and engages with many of the fundamental ideas of this current research. It was created for an imagined and physical space modelled on the dimensions of an ancient Greek theatre.

4.2.1 A chance to research

In 1988, City University, London accepted my application to do a Masters in Arts postgraduate degree and I was able to research and develop my compositional and performing ideas in conjunction with electronic sound technologies. I studied under the guidance of Dr. Simon Emmerson, the renowned Electro-acoustic composer and academic, and challenged many of the practices that I had accumulated in my working life as a musical artist. Amongst the many pieces of work produced in that period of reflective opportunity, I composed pieces that negotiated new perspectives on the performative context. These extended from simple combinations of pre-recorded tape and acoustic instruments, to live sound diffusions of reprocessed recordings. Much of the material

produced was concerned with the relationship between different performance domains. An example is the piece 'Big Boom' which consists of a recording of two percussion players using separately configured click-tracks in separated studio space. The two parts are then remixed with computer generated equalization movements and interchanged with short outtakes that have been edited further. The piece is then performed as a sound diffusion on a six-speaker system. Each layer of the piece is a performance that is then reconstructed performatively into another performance.[27] The potential for electronic processing and sound diffusion to allow the performance to extend out beyond the proximal instrumental setup presented new opportunities in my work. This ran alongside investigations into responsive and interactive interfaces that functioned through MIDI and analogue networks, permitting the control of devices embedded in distant sound and light diffusion systems. The concepts that defined my performance spaces and how they formed a basis for composition seemed a natural place in which to operate.

Fig. 4.2 Performing on the MalletKat

As part of a solo contemporary music concert for the Almeida Festival (May 1988, London), I performed a new work titled, 'Tokyo Mix'. The piece was constructed from materials gathered in production rehearsals by the group, 'Man Jumping' [28], of which I am still a member. It was performed entirely on the MalletKat, then a new electronic kind of MIDI xylophone and the first to be used in Europe (Fig. 4.2), in conjunction with other technologies. The piece was composed by a number of collaborators using a sampler/sequencer called an AKAI MPC60 that could store and manipulate sound data; basically a specialised computer in a standalone box. This device allowed the four

[27] ' Big Boom', First performance. Electro-acoustic Festival, City University. (1989)

[28] https://en.wikipedia.org/wiki/Man_Jumping/ (Accessed 17/10/17)

collaborators to contribute different musical elements to the score and to integrate different composition methods. This piece was performed in the context of a contemporary music concert and other works in the programme followed the convention of highly organised and notated composition by a single composer for the performer to realise in the performance.

An interview I gave with 'Music Technology' magazine at the time gives a sense of the different layers of work necessary to produce the work.

> *At first I was using the MPC60 just by playing the drum sounds on the pads. Then I put these random pulse parts into it with different dynamics and panning effects. Over the top of that I put in a very light cross rhythm, very loose, but in 22 or 50 bar phrases and left out all the really big moments like bass and snare, so that it became more like a texture which people could interpret in any time signature they wanted. Later in the week I wrote this wildly developed bassline into the MPC60 then did some very loose percussion parts on top (Interview, Nicholas Rowland)*

4.2.2 Making new spaces

After the Masters Degree, I reconnected with the contemporary dance world, creating a number of scores for the choreographers Sue MacLennan and Rosemary Lee. For me, working with dance always provides a great opportunity to enter a powerful dialogue between the embodied energies of sound and the human body. Each discipline brings new understandings of the relationship between corporal and temporal activity. There is a creative space that can be occupied by both kinetic and sonic language.

The first piece 'Ugh'(1990), for Sue MacLennan Dancers, combined different rhythmical strata that broke into each other, continually shifting the placement of strong and weak beats. My motivation was partly generated by observing dancers' responses to rhythms I played in dance classes. The score used digitally deconstructed vocal components with low bass sounds used for down beats and higher sounds for up or off beats. The disconnected phonemes, plosives and glottal clicks were a form of the vocal

sounds used by a dance class leader to count out the dance steps and rhythms.. The mixes of the piece were repeatedly shifted in order to keep freshness and an element of tension between the shifting sonic emphasis and the gravitational bias of the moving body. The piece was situated somewhere between rhythmical displacement and embodied sonic emphases. In many ways, this work was an extension of my role as a performer, using my experience within dance disciplines to create a score that sourced embodied vocal sounds to produce a dialogic tension and resolution in the human body; a conceptual view often referred to in the work of Cage and Cunningham (Cage, 2009, p.88) Although this activity can be considered part of my compositional activity, it is also a useful example of the evolution of performance practice that moves beyond the paradigms of existing scored contemporary music and the hierarchical structure of a composer directed score. The score interprets body movement within its situated space.

The previous work was 7 minutes duration and was followed by another for Sue MacLennan titled 'Continental Drift' (1991), in two parts lasting nearly two hours. Compositional ideas from the earlier work had some impact on this score but the scale of this piece allowed for a larger structural canvas with scope to construct multiple layers and sections. The large-scale event permitted the creation of an imagined space, with much of the score determined by sonic realizations of physical internal and external spaces. The score used musical ideas determined by data derived from extra-terrestrial space (entropy), and subterranean structures (rocks, crystals), to imply a middle ground with the tensions affecting the surface of the earth. As well as sound processing and manipulation, there were recordings taken from train journeys in the London Underground and from inside the human body: an attempt to integrate external and internal sound resonances.

The external and internal spaces of a building are the focus of the next piece of work, 'Heaven's Gate/Sonus Lux' (1987). As a part of a celebration to re-launch the Felix Meritis building on the Keizersgracht, Amsterdam, I worked with performer/artist Harry De Wit[29] on a sculptural sound installation that functioned throughout the building and on the façade. The piece is written about in more detail in Chapter 6 to investigate ideas about the physical locations and structures for performative activity.

[29] https://www.harrydewit.info/installations

Much of De Wit's music is concerned with sound qualities, with new and unusual sources at the centre of his work. Examples are 'glass-harps', resonating stones and amplified large electric sparks. In the recording stage, I was the Musical Director for the ensemble and performed on many acoustic and electronic instruments, utilizing conventional instruments like cimbalom and marimba alongside the samplers, sound manipulation and synthesis. The recordings were created in such a way that they could be mixed together in different combinations for the final installation around the building.

Later, in the case-studies, it will become clear that my experiences outside of the classical mainstream, especially those gained outside the UK, have had a major impact on my practice and I have creative partnerships with artists that continue to the present day. The project that follows was partly built on skills learned from these experiences.

In 1992, Rosemary Lee commissioned me to make the music for a large-scale work, titled 'Ascending Fields', to take place in the, then disused, Fort Dunlop tyre-factory, Birmingham. The production included Rosemary Lee Dance Company, a local community-based dance group, a core mixed electronic/acoustic music ensemble, a large community music ensemble of mostly brass instruments, a visual artist, four sound-systems, a large lighting rig and of course the enormous scale of the factory. There were hundreds of people involved and the scale of the piece was an exciting challenge. This work was a major undertaking, as I composed, rehearsed and performed the music with more than thirty-five musicians. It combined many of the skills I had developed on site-specific projects outside the UK, integrating composition, music technologies, performance, movement, and community-based activities, into an industrial space. This large-scale work is used as a case-study in Chapter 6, to investigate the use of different physical structures and buildings as locations for performance.

There have been many projects over a span of three decades that have merged social, physical and creative practices. There have always been elements in my work that have shifted the performance beyond that of paradigm of a concert platform performance. Is this reconfiguring partly a result of the fact that as a percussionist I already have to deal with the physical space in a way that most other instrumentalists do not, in order to

organize and set up my instruments? Configuring the space becomes part of the process in creating the work. The topic of performance-space design and architecture provides concepts that inform the boundaries of the 'performance-locus' and is dealt with in Chapter 5. The fact that much of my output then, and now, has continued to take place in these sites has had an impact on the way I think about many aspects of my performance practice. A specific example from my practice would be the period when I rented a warehouse space. The space was set up for experimental theatre work and the environment was suitable for my work with mixed-media. The inclusion of lighting, sound diffusion, visual layout and choreography was possible in this space in a way not possible in most musical rehearsal spaces. Elements of the performance environment have featured, either by a direct reference through the use of integrated local sound or physical materials, in my creative process.

The focus on physical location is further illustrated in two projects; Sweatlodge[30], created by Man Act for the Tramway, Glasgow, and 'Sonic Harvest, AREA 10 ' [31], a collectively run multi-media project in a disused timber yard in Peckham, London. My involvement with these projects was separated by a period of about eight years, so I refer to them because of common ideas that link them. They were both made for initial physical spaces that stood outside the normal established arts performance space. The Tramway [32] is a converted tram depot that was adapted for Peter Brook's large-scale work 'Mahabharata' in 1988. It is a large flexible space that can be reconfigured into many formats and sizes of performance space and maintains a legacy of its industrial construction, in Peter Brook's words, "An industrial cathedral that connects art with humanity". The Timber warehouse in Peckham, behind the new Modernist library with its green 'stilts', was simply that; a large indoor open space with adjoining rooms that were used for different creative projects, in my case a temporary community drop-in recording studio. Sculpture, visual media projects and performances occupied the interior and exterior yards. One common element of these two sites is the very nature of the building's construction, as they are made to function as places for industrial machinery and the movement of large-scale materials. This means they provide large robust and adaptable

[30] http://www.simonthornemusic.co.uk/manact.html

[31] Area 10 Project Space https://www.artrabbit.com/organisations/area-10-project-space

[32] http://www.tramway.org/Pages/Tramway---A-History.aspx

spaces with scope for different physical relationships between the makers and receivers of creative materials. As well as the industrial aesthetic provided by these buildings, they also present a different cultural environment that absorbs traditional possibilities into a broader perceptive space that allows borders between different practices to shift back and forth without any concern for conventional categorization. The spaces are considered as part of communal social structure and operate an open policy in the ways that the audience is engaged with the activities within. The Tramway was set up in the Glasgow Year of Culture (1988) as a way of bringing a performing community into a local community. The scale of the narrative, the spaces, the number of performers and multi-faceted form of the presentation engaged the people of Glasgow in a way that has rarely been done. The Area 10 Project, though smaller, was integrated into a local community for seven years, inviting people to be audiences and participants. The created materials in the productions reflected this openness and in both 'Sweatlodge' and 'Sonic Harvest' the working process were built around the creative input of the participants. The industrial spaces were a kind of metaphor for shared creativity, the workforce producing their own art instead of manufactured goods; a political reclaiming of their own energies and output. The physical locative phenomenon impact and frame the performance space and set out the tools that might serve an aesthetic landscape: Machines that manufacture objects and a process for dealing with them. Physical space can be understood as a container, instrument or structuring component of a music score that contributes to an evolved notion of the performance locus.

The relationship between physical deconstructed spaces and performance practices has always seemed to be better understood and supported outside the UK, based on my experiences of working in Holland, Italy, Germany, France, Belgium, Denmark, Sweden, Australia. Whilst working extensively in Belgium and Holland, with experimental music ensembles, theatre and dance companies, it seems no coincidence that the only visits by those projects to the UK were to the re-used warehouse spaces of the Tramway, Glasgow, despite extensive tours to the rest of Europe and the USA. Although other spaces have opened up in the UK, with new architectural designs that incorporate flexible spaces, reconfigurable performative environments and a rethinking of the integration of the arts within communities, the prevailing dynamic is towards the final staged performance and a compartmentalization of the disciplines. New technologies, including new dynamic physical spaces, don't seem able to sustain a comparable new artistic environment, often

presenting the work in final presentations, separate from any sense of the work as a creative process. The final conventional performance format is still the dominant paradigm. My experience of work in many countries outside the UK, is that many formats of performance/audience relationship are possible. Although there are many programmed activities based around the conventional concert or theatre space, there is a long-standing tradition of activities outside that convention.

4.2.3 Engaging with industry

After a period of highly productive composing, touring and recording, an earlier project, The Lost Jockey, faltered and split into a number of smaller groups. One of those, Man Jumping, had commercial ambitions, aggressive management and a record contract. The group made a number of albums, successful contemporary dance collaborations and performances in major venues. It was the beginning of cheaper digital technologies and the musicians invested in digital samplers, sequencers and programmable sound-processes. The music industry was slowly waking up to the implications of digital reproduction and the problems of copyright control and digital downloading hadn't shaken the business yet. The shift in my practice was starting to be determined by the varying speeds at which the arts industry woke up to the new possibilities.

An obvious fundamental change brought about by new compact technologies was that the large recording studios were becoming redundant. The home recording space became the centre of musical activity, and an instrument in reach of anyone with a little cash. This has continued as a creative resource for the majority of music that we hear through other media like film and radio. The impact of this access to the production process has implications for the development of the aesthetic, theoretical and performative contexts and it appears again that considerations for creative practice are located somewhere new. In the Chapter 7, I investigate the impact of new technologies on the positioning of the performer and audience, with new performance spaces and communities.

4.3 Network

The developments in computing technology meant that in 1996, I could set up a website that situated my work into a new space; the Internet community. The original

homepage was computer graphic set of objects that could be interacted with in a rudimentary way; rollovers changed the image and produced sounds. With the possibilities of new HTML coding, it was possible to build creative presence on the Internet. There was the potential for a website to explore a new relationship with an audience in ways that avoided the conventions of the music business. It was possible to be a single artist operating from a small space but able to reach anyone connected to the network. The website was a place to promote a new solo CD, 'Steam' (1998), and present an individual view of my own work and its context. This collection of studio pieces was influenced by the many different musical and environmental sounds heard in the parts of London where I lived and worked; pirate radio, broadcast from South East London housing estates, and the sounds emanating from the reconstruction of the Isle of Dogs by the Docklands Development Corporation. The DDC even assisted in the development of the community–based studio 'The Steam Rooms', that was installed on the top floor of the closed Bow Baths; the empty swimming pool occupied by bricklayers training to work on the growing Canary Wharf site. Illegal radio stations squeezed between the official broadcast frequencies to promote their own musical identities. This was not part of the mainstream and I recognized the new energy from a community finding its own identity against a background of the City of London reinventing itself as a global financial market. So much of this was possible because of new, cheap technologies at the beginning of their rapid development. There were difficulties to do with connection speeds, processing power and capacity but these evolved at a rate that continues to accelerate today. The development of the digital industry starts its own steep trajectory at this point, with many implications for musical activity, and I will deal with this in Chapter 6.

My website was initially a way of creating a presence on the internet which then developed into a new place to make work and engage with a web-based audience. It allowed me to work as an artist in ways that had yet to be explored by mainstream culture. Until 2021 the site, 'www.marimbo.com' had hand-painted messy images, splashes of colour, a playful responsive set of sounds and a web-based composition built specifically for networked musical interaction, *dot-machine.* The website has been re-launched using Dynamic HTML5, working with web-designer Dev Morgan, with new interactions, audio/visual responses and an updated *dot-machine.* The design reflects ideas concerned with the website as an active location for performative materials, and as a portal to related artists and collaborators. It is a focus for an Internet community of creators.

The developing function of the website and the creation of ten CDs of my own performances and compositions are factors that have informed me on ways to reassess the role of the different forms of my performances and how they relate to an audience. In 'How Music Works: Business and Finances' David Byrne, of the band Talking Heads, devotes a chapter to an analysis of changes in the music industry, as a result of changing technologies and how they have impacted the access and distribution of music. (Byrne, 2013, p.213). The CD has become something new and functions in different ways for different parts of the music industry. For some it is now a cheap 'calling-card' that allows listeners to find out more about the music before committing further and either financially supporting the artist or getting closer to their work through live performances. Other parts of the industry are still selling the CDs to make money, yet the sales are quickly declining as downloads and then streaming become acceptable. In 1996, when I embarked on a solo CD of entirely my own work, the budgeting and planning was based around unit sales of the final CD; a financial return from the sale of a calculated number of unit sales. Within six months I discovered that the return was coming from other uses of the music on the CD. It was used for films and trade events that produced enough of a return to pay for the production outlay, and I still had the CDs to sell. I could afford to send out 'free' promotion copies and put them in the hands of potentially interested promoters and broadcasters. One result from this was that tracks from the project were broadcast within days of its completion and that I could embark on the second CD. The democratization of the sound recording market has allowed individual artists, such as myself, to decide how to operate and define our relationship with an audience. There is fluidity in the way that this technology can operate. The term 'fluidity' provides a way of considering the continuously changing connections that thread throughout the performative locus under investigation in this research. It provides a useful understanding of the continually shifting pathways that connect and then move away from the different modalities of architecture, sociological, performance-practice and other. A key element that provides much of the connectivity is the technology revolution of the last twenty years, a dominant feature of recent developments that are becoming central to the positioning of arts culture in western, and global society. Current books, such as 'The Second Machine Age' (Brynjolfsson and McAfee, 2014),'Why It's Kicking Off Everywhere'(Mason, 2013) and 'Post-capitalism: A Guide to Our Future' (Mason, 2015), outline and situate the digital media revolution with a view to the social consequences.

Fig. 4. 3 24 hour duration performance of *surfaces* Saunders/Limbrick, also broadcast/streamed live over the Internet. Art Studio, Huddersfield Contemporary Music Festival, 2011. Photo: Dev Morgan

4.4 New Techronomies: tools, media, alignment

In Fig. 4.3 above, I am performing 'Surfaces', a collaboration with the composer James Saunders. The work is focused on the making of sound with different surfaces – sound as property of surface . The continuous performance can last up to 24 hours, and uses the changing qualities of light, sound, and location to engage with the changing awareness and perception for everyone present. A quiet sound, for example, can have different qualities dependent on the time of day, as the context of the ambient sounds change . The performance is also broadcast over the Internet, so it can be accessed from anywhere in the world. The possibility for different experiences of perception and awareness over the duration of the piece is then also shifted as the performance crosses time-zones. As the performer, I had deliberately created this situation and am aware in the performance that a local action can be perceived differently in another time-zone. The performance invites local observers to stay with the piece for as long as they wish, as for the Internet observers, they can choose to leave, revisit or change location as they wish. The piece has produced some interesting feedback from around the world, sometimes during the performance, as online messages can be read by the performer.

The current performative environment seems almost unbounded by its possibilities, as the physical location is integrated into the Internet network. The connection with an audience is possible through contexts and networks that are shaped by the relationship with different forms of technology, crossing domains such as architecture, instruments, artistic practice and tempo-spatial relationships. When, how and what is engaged in a performative 'locus' is observable through a blurred and drifting lens. The powerful wave of energy pushing forward new technologies and social development creates a cultural 'unfixedness' that requires tools such as 'fluidity', 'adaptability' and 'creativity'. The relationship between performer and audience in a performative occasion is no longer constrained by shared physical spaces and simultaneous moments in time.

The event is already changed and continuing at a rapid pace, whether its large institutional organisations, like the Berlin Philharmonic Orchestra [33], The Royal Opera House[34] or smaller sub-cultural projects such as and Mocrep [35] or Squib-Box [36]. These examples are present through their accessibility on the Web. The difference between many of the websites is the offering of the potential to interact with the materials offered, encouraging the visitor to engage with them as an online community. Often the community is built around the conventions of musical performance with the performers playing to the audience. The amount and availability of contextual information with virtual representations and 'behind-the-scene' insights offers a new way of engaging with the musical materials; it is becoming a way of experiencing them outside of the conventional performance spaces. The concert hall, the physical site of a performance, is becoming a place of production and the capture of the live performative occasion, in order to then convey it through other, now widely, accessible forms of mediation. These sites and many others, like the South Bank Centre and the Barbican, London, offer a virtual 'walk-through' of musical events similar to 'virtual' gallery versions of Art Galleries, such as the Louvre Museum, Paris and the Tate Modern, London, and first appeared around the early 2000's.

[33] http://www.berliner-philharmoniker.de/en/ (Accessed 4/6/16)
[34] http://www.roh.org.uk/about (Accessed 10/10/15)
[35] http://www.mocrep.org/who/ (Accessed 15/11/17)
[36] http://www.squib-box.com/ (Accessed 10/6/19)

The adoption and development of the new media is driven by financial demand, so the cultural domains that receive the highest investment are sports and computer games. The latter domain currently (in 2020) being the largest global cultural industry above film, popular music and sport. Investment in digital development is being maximized in the field of immersive formats, visually and sonically, with a renewed interest in ambisonic and binaural sound, virtual 3D environments, motion- sensors[37]. The larger Arts organisations have adapted some of these technologies, with digital access being a prioritized activity that can include mercantile operations, artistic insights, marketing and interactive resources for a wide range of communities, such as participation and education.

As the sound and visuals become accessible through digital media, they are then in a domain that has the tools to manipulate and reconfigure the performative context in a way that differs from any 'live' event. It can be observed at later and multiple times, with the options of control over the selection, speed and direction. Newer interfaces, both hardware and software, provide a simulated 'intimacy' that allows the user to 'walk-through' and around the virtual representation the space[38]. The experience of the event is mediated through the web-technologies and through individually carried gadgets, with the mobile phone, tablets and handsets now providing high quality applications for a creative and interactive engagement. The South Bank programme allows viewers to use their own mobile unit as a 3D 'walk-through' device that enables access to the orchestra performance space.

4.4.1 Tools, instruments

At this point, it is useful to look at the tools in the hands of the practitioner. There are the interfaces that are more recognizable, like the keyboard or microphone, and those that connect with computer-like processors. There are also newer forms of interface that are built around sensor- devices, converting environmental, responsive and haptic information into digital data formats. There have been earlier attempts with instruments

[37] https://en.wikipedia.org/wiki/Ambisonics (Accessed 3/5/19)
https://www.oculus.com/en-us/rift/ (Accessed 5/3/15)
https://developer.leapmotion.com/documentation/cpp/devguide/Leap_Overview.html?proglang=current (Accessed 23/3/14)

[38] http://www.telegraph.co.uk/news/newstopics/howaboutthat/12128254/Southbank-launches-virtual-reality-orchestra-as-director-vows-to-keep-up-with-digital-world.html

like the Ondes Martenot[39] and the Theremin[40], but important developments have been the availability, through lower cost and production, the speed of the functioning, reliability and portability. The accelerated development and capacity of computer processing power, in combination with a global access to shared research, has put the tools of the industry into the hands of individual practitioners.

The access to the resources needed for self-production and distribution have allowed artists to create music-making strategies outside the scope of the major institutions, such as large media production companies and educational institutions. There is even a preference expressed sometimes that this gives independence to the artist and avoids being locked into institutional structures. Many creative studios and recording businesses are built around the portable configuration of a computer laptop, microphones and a pair of headphones. The stripped down configuration allows flexibility in the choice of site, acoustic and surroundings. It also allows for a choice of dissemination and distribution of the performance materials, with access to 'live' streaming, 'real-time' networked performance, the participation and sharing possible through social media.

As the communicative technologies have improved, the 'distance', as a factor sensed across the network, has reduced and the current situation allows musical contact with audio timing differences close to those for physical distance between participants in the same location. The timing differences depend on the physical distance, speed and capacity of the connection, and the technical resources available to the artist. The improvement in the timing and quality of the connection means that it is possible to work creatively across the network, with artistic solutions to the variations that still exist. The 'distance' experienced between nodes of the network are equivalent to the physical distances in physical performance space, when in the range of approximately 10ms to 100ms. The latency in the sound reaching a percussionist's ear, when striking a drum, is approximately 2.6ms, dependent on factors such as air temperature, and a small stage area equates to differences of between 15ms-20ms. There are many approaches to calculating latency across the internet, with the speed of light being a constant factor that is implemented through the refractive and conversion issues with optic-fibre connection.

[39] http://www.thomasbloch.net/en_ondes-martenot.html (Accessed 17/6/2017)
[40] https://en.wikipedia.org/wiki/Theremin (Accessed 20/8/2017)

Relatively easily resourced internet connectivity can deliver less than 20ms across a 100 miles, which can vary according to the network pathways and density of connection nodes. Even with greater physical distance and differences in timing, it is possible to find other creative approaches, with some adjustment of how to relate the different elements of the musical performance. The 'distance' becomes a component in aesthetic of the work, where the other factors, such as a high level of control of the soundscape and sound production are acceptable to the artists. This can lead to a re-focusing of how the musical elements relate to each other and what constitutes a performative activity. This topic is dealt with in Chapters 7 and 8, in relation to *technology* and *community.*

Conclusion

The purpose of the writing in this chapter was to set out some of the key examples from a personal history that would contribute to the argument for a re-evaluation of the musical performance event. They have been selected from among many other events and projects because they seem the best candidates for demonstrating the changes in the conditions that inform my performance practice. The intention is to signify key moments when the conditions for music performance shift from the conventions of staged music concert performance. Drawing on performance activities prior to the case-studies carried out during this period of research, they provide evidence of a transformation that spans my earliest to most recent performance activities. The period covered by the writing in this chapter covers many of the changes observed since the 'new music' works from Stockhausen, Boulez and others, were created in the 1950s. They provide an extended view that covers five decades of activities and experiences that can used to support the nature of the evolved loci for new music. The ideas informing these examples are developed in subsequent chapters.

5 Evolved Practice

Introduction

Key to the identification and understanding of the locus that informs the performative event is the role taken by the performer. This chapter is focussed on the activities of the performer whilst in the process of making musical works for performance. The practical work is documented in case-studies, each uniquely configured with a particular set of constitutive conditions and parameters. The musical work in the case-studies also serves as a framework for practical and theoretical enquiry, as it follows a path to the eventual performance event. Each case study follows the activities of the performer in order to investigate what informs the practice. These case studies provide material for critical reflection. The first part deals with key terms and topics that are used in the subsequent case-studies.

It was suggested in Chapter 1, that there are many conditions that determine the nature of a particular musical performance. The conditions that inform the locus for musical performance are part of a complex multi-layered structure. This chapter is focused on the practice of making musical works, in preparation, and during their realisation in a performance. A particular perspective is taken from a position within the performance practice itself, and these case studies reflect musical practice that is focussed on a solo performer. Performative action motivates the direction of the musical practice and determines much of the dynamic of its contingent parameters.

In the Introduction, a list of possible conditions was given, with ideas about how they could be applied to a model of the performance locus. This chapter attempts to set out how that model can be understood, in a process of identification and disassembly of the practice of creating musical works. Some of the conditions might seem to have agency under more than one heading, and that possibility constitutes part of the enquiry in the context of the practice. The list does not provide a complete definition of how the performance locus is constituted; it can be understood as a method to address the more influential conditions and parameters. The list is also placed here, in order to highlight the focus of this chapter and the subsequent connections with the practical work.

Practice

The body, actions and presence of the performer

The nature of identity in the musical work

The musical object as text, concept or experience

Performer as 'interpreter'

Technique and virtuosity

Technology

Musical resources and technologies

Interface

Mediation

Communication

Community

Relationship between performance, performer and audience

The nature of 'liveness'

Temporal and spatial components

As each case study draws on different strategies, the ideas that inform these conditional terms are unpacked and developed. Ideas are explored in relation to the context in which they are found and in relation to other case-studies. The context for the musical practice includes the activities of the performer, playing musical instruments, engaging with other participants and the musical materials. Understanding how the performer is located in the space for the practice is the concern of ideas concerning 'embodiment', 'presence', 'encounter' 'audience' and these were addressed in Chapter 5. These terms are used in order to understand the conditions affecting the agency of the performer, and the relationship with others present at the musical performance event. The discussion on the topic of combining writing and practical work informs any instances of performance practice throughout this research. The localised setting of most of the practice in this chapter, means that those ideas are very much part of the discussion in regard to its case-studies.

There are four case studies that each contain musical works. The case studies each define a particular direction for the practice, with each characterised by technical

configurations, use of musical instruments and production values. The musical works reveal similarities and tensions when they are viewed alongside each other, and common lines of discussion are at times carried across the case-studies. There are occasions when a single condition that informs the practice operates in a different way, so comparison of these operations is also useful. Documentation for these works, in the form of sound-recordings, film, scores, photographs and graphic images, can be accessed in Appendix 1. There are also links to the appropriate materials at the start of each case study. Audio and film recordings can also be found by following the Internet links.

Case studies:

1. Vibez Project - Four pieces for vibraphone and mixed media
2. Re-Location composer: Jonty Harrison/Simon Limbrick
3. A First Show : Dominic Muldowney
4. Islands : Ed Kelly

   The Five : Bret Battey

   Octagon : Lee Westwood

The case-studies address creative musical practices that engage with:

The relationship between performance, performer and audience

A shift in the dynamic between the role of the composer/performer/audience

Musical resources and technologies

The development of new musical resources and technologies

The performer as *interpreter*

Performing disciplines such as collaboration, improvisation

The musical object as text, concept or experience

A *score-text* defined by contextual, technological, visual, aural information

5.1 Case Study 1

Four musical works for vibraphone, printed score, MaxMSP software, contact microphones, triggers, motion-detectors, visual images, spatial sound diffusion

Title **Composer** QR Code

Skin **Gregory White**

Track 3 and 7 /Appendix 1

https://soundcloud.com/simon-limbrick/3-skin-doubled-composed-greg-white

Island of Silhouettes Ruta Vitkauskaite

Track 2 /Appendix 1

https://soundcloud.com/simon-limbrick/2-islands-of-silhouettes-composed-ruta-vitkauskaite

Algo Vibes **Angus Stewart**

Track 1 and 8 /Appendix 1

https://soundcloud.com/simon-limbrick/1-algovibes-composed-angus-stewart

Points **Simon Limbrick**

Track 4, 5, 6 / Appendix 1

Copies of the materials are also accessible in the media section of the Appendix. The links are also set out as QR codes, read with an 'app' on most 'smart'- phones.

The QR code link method can be very fast to upload, if the device is in a zone with good Wifi coverage. There are characteristics of this access, such as the immediacy and qualities of the media, that are the subject of the enquiry within the Chapter 7.

Case study 5.1 focuses on a folio of four new musical works that focus on a central musical instrument, the vibraphone. These works, and their related texts, are gathered as a single case study, focused on the practice of making the musical works for this instrument. The investigation attempts to discover the conditions and parameters that inform the production of this collection of musical works, in which the vibraphone is a constant figure. By maintaining the use of the same instrument as the focus, the intention is then to identify and observe the various conditions and understand how they operate across the works in this case-study, in a process of identification and then testing the value of their contribution. If there is evidence of development and change in these conditions, then this contributes to a sense of a new formation of the locus for the performance of new music. In this case study, the vibraphone is a central component, constant in every musical work, and around which the practices of the performer and the conditions of the performance are located.

5.1.1 Vibraphone

The musical instrument at the centre of this collection of musical works is a relatively new instrument in relation to the history of other western classical instruments, such as the violin or piano. As a technological object, it has been developed over the last eighty years, with continued innovation over the period since the 1950s and identified as the focus for this research. The domain of technology, and its development, contributes many of the changes and new conditions to the performance locus; the vibraphone can be seen as part of that contribution and representative of the central impact of those changed conditions.

The vibraphone is a percussion instrument that offers pitched resonant metal sounds and a developing body of performance techniques. Each work employs a different approach to the production of musical materials and is a product of different creative processes. This instrument provides new sounds to the corpus of western musical instrumentation, with pitched metal resonating bars that are configured in a keyboard

percussion layout. The new sound qualities made it attractive to musical genres beyond its early jazz music context with its adoption into classical musical works such as Alban Berg's Opera 'Lulu' (1935) and Benjamin Britten's Spring Symphony (1949). In this case-study, the intention was to produce a set of new works that exploited the sound in different ways, through the use of extended performance techniques, changes of instrument design, the development of an extended sound palette, and the use of integrated electronic sound technologies that exploited the performative and physical properties of the vibraphone. Details concerning the development of the instrument and the techniques used to perform on it are given at points in this chapter, as they relate to a line of investigation within a musical work, and where a better understanding of its functions helps to further the research.

Compositional and performative activity was limited to the space defined by the processes of production of the new work, with the performer and specific instrument in relation to each other; a physical space bound to its abstract space of theory and aesthetics by the action that took place. The activity leading to the production of new works for vibraphone took place in a single studio space, in an attempt to keep a consistent working environment in which to contain different creative practices. This served as a creative laboratory in which to discover and challenge theory and practice, and the relationships between them. The continuation of the production process then led to the works being taken out to public performance contexts, such as concerts and the distribution of the materials through recordings available on CDs and the Internet. The intention was to make the performances as accessible as possible using different strategies to engage with the audience as participants in the making of the performance.

The entire process stemmed directly from operations between the performer and the vibraphone. The focus was directed at the conditions informing performance around a confinement of the practical configuration, to expose their workings and understand how they varied for each musical work.

5.1.2 Working on new materials

Critical and theoretical positions are not assigned uniquely to each work-context; it is more the case that each work provides a different focus for a particular direction of

investigation, with the possibility of ideas being present in other works. The choice of a single physical object does not assume that the conditions present in one work are also present in the others. Key ideas are identified in each case and brought together as the chapter develops, to conclude with ideas that thread through all of the other case studies and writing. It is intended that this collection of practical works provides a creative laboratory in which to discover and challenge concepts that inform the locus of musical performance.

At the centre of these works are my actions as the performer concerned with the making of the work in a space defined by a set of conditions and their relations. The boundaries of this space and its content are manifest by the active presence of the performer. The activity, ranging from physical instrumental action to internalised responses to aspects such as spatial awareness and the score-text, asserts the existence of the performative locus. The focus is on the process of making the work, whilst acknowledging the agency of any concepts and theory that inform it. The actions are informed by the conditions and terms listed under the three headings. The performer embodies the knowledge by their actions and substantiates the conditions for performance by producing the work.

Materials from each work are specifically referenced within this chapter and there are links to audio recordings, films, score-texts and images within the sections dealing with each work. Documentation is accessible in  Appendix 1. Media,  Appendix 2. Technical

5.1.3 Performing musical works

Four musical works for solo vibraphone now exist as a result of an extended period of composition, collaboration and dialogue. Three of the works are by the composers Angus Stewart, Gregory White and Rute Vitkauskaite; one work has been created by myself. The portfolio of musical works, each based around different creative actions, has been created in the studio and then realised in a number of performance contexts. All the pieces have been performed, as part of a presentation/paper around the research topic, at Middlesex University (October 2015), University of Sussex (October 2015), University of

East Anglia (May 2014) and Bath Spa University (November 2013 and May 2016). There were further presentation/papers at De Montfort University in 2017. The works are to be distributed through a publicly released CD and digital music streaming services. There is documentation of the processes, discussion and musical activities from different stages of the development of the works in the form of texts, images, audio recordings of all of the works and films.

> *A performance-based project focused on the vibraphone, incorporating extended playing techniques, alternative compositional processes and technologies, including responsorial algorithms that affect the sound, visual media and sound diffusion. By exploring the sound of the vibraphone, it is possible to deconstruct some of its musical legacy and reduce it to a form of pure sounding metal ready for transformation.*
> (Limbrick, From publicity for 'Vibez Project' Performances, 2017-2018)

This a programme note for the set of works illustrates how there was an attempt to remove some of the cultural identity associated with the instrument, as a jazz instrument, in order to make it available as a metal sound-making source ready for a wide range of electronic processing and compositional practices. The vibraphone has its roots in the jazz world, and though it has become a different kind of instrument within contemporary classical music, with many new playing techniques, it can easily be associated with its jazz context. As the programme note shows, there was a more literal description of the construction and sound qualities, that attempted to remove some of these associations.

As the methodologies applied to these materials overlap across the different works and to other areas throughout this research, the intention is to identify and draw out these links. To bring the concept of the informative locus into view it is necessary to unpack the various forms of practice and consider the relevance and strengths of the evidence. The explorative scope of the constructive processes encompasses strategies that fall within a range of methodologies that range from discussion and questions in rehearsal, correspondence about technical design issues and performance direction, feedback from collaborators and audience members, critique of processes through recording and writing the works.

As set out in Chapter 3, the enquiry examines the practical work from different perspectives that establish a method for collecting and viewing a particular set of conditions. These perspectives include: Authorship/Collaboration, Physical/Virtual Space, Social/Cultural context, Temporality and Place, Collective/Individual Distribution. These perspectives are articulated in three areas that intersect to outline the robust and consistent conditions that support the locus of performance: *Practice, Technology* and *Community.*

The enquiry considers aspects such as the development of the technical structures, design and interaction on a musical instrument, and the testing of compositional decisions through performance and different forms of feedback from collaborators and audience. These investigations were done in the contexts of different locations that included different physical performance spaces and technological distributed sites such as the Internet. Information was gathered during discussions, rehearsals, performances and presentations, in the form of texts, emails, and audio/visual recording.

5.1.4 Skin Doubled Gregory White

Audio accessible (Track 3 , 6 and 7) Appendix 1

https://soundcloud.com/simon-limbrick/3-skin-doubled-composed-greg-white

Instrumentation: Vibraphone, Contact microphones, Max4Live software, laptop, sound interface, stereo sound diffusion.

The work takes the form of a software patch created by the composer, which allows the player to explore a defined set of musical possibilities. In the performance it is the relationship between the composer and the performer that produces the work; the performer has to engage with the processes programmed into the software, that produce the electronic sound framework of the piece. If the performer makes no attempt at interacting, then nothing happens; there are no sounds to respond to. In the process of making the work, the performer collaborated with the composer, in order to create a

'doubling' of the original patch, to give different pulses and pitches, and corresponding to right and left hands playing on the vibraphone. A screen-shot of the Max4Live patch can be found Patches/Appendix 2 

5.1.4.1 Authorship and Identity

This work is used primarily to inform a discussion around the topics of authorship and identity. The technical functioning of the instruments and the production of the sounds are intrinsic to the functioning of the musical score or text. These topics will continue to appear in relation to many of the musical works in this research, and in relation to different performing contexts and media.

5.1.4.2 Musical Text

To understand how the musical text for this work operates it is necessary to describe how it functions. There is no written or notated text or instruction. The information that guides the performance is provided through the operations of the software and interactions with the playing of the vibraphone. The score-text can be understood as a combination of the software patch and composer/performer collaboration and the input of verbal discussions during the rehearsal/production period.

The work depends on collaborative activity between the composer and the performer. The production of the sound content in the performance is governed by decisions made by the performer. The choices available include the pitched and rhythmical content, as well as choices of timbre, attack and duration of sounds. A trigger fixed to a pitched bar of the vibraphone initially samples that sound, at a pitch chosen by the performer, which is then used as the sound of a pulse generated by the software. The starting, stopping and speed of the pulse is changed by then hitting the same bar. The rest of the pitched bars are available to the performer to play materials in response to the sounds of a pulse at varying speeds or not sounding until it is started again.

5.1.4.3 Directed by the software

The composer directs the performer with the stop/start/speed structure and choice of pitch centre sampled uniquely for each performance. The performer has many choices in response to the information given by the software, but it soon becomes clear that the choices are restricted by the pitch and speed of the playback. The performer is able to respond with their own choices, but this is dependent on their compositional experience and judgement. There is scope for many different responses, from simply imitating the pulse to completely playing against or even ignoring it. There are circumstances that militate against some types of action. If the player imitates exactly by going to the pulse-trigger bar, or is musically persuaded to do so by closely following the pitched pulse, then eventually the original bar will be struck and the pulse will stop. There is then the choice of restarting the pulse, but the software will always generate a different pulse speed at the next strike. In order to continue with the work, the performer has to decide to strike the pulse-trigger bar and work with consequent change. As it is possible to strike the 'trigger note' by accident or deliberately, the changes can be both player-determined and random. As a sounding musical work, the composition depends on the combination of the software framework and the sounding input of the performer on the vibraphone. The authored material, in software media, is a framework for a collaborative activity with the performer.

5.1.4.4 Identifying the author, composer and performer

The musical performance is the result of a performer working creatively within a defined software framework. The writing of the software patch defines the boundary of the musical work and directs the choices available to the performer, who then contributes their own creative input. If the text was for a theatrical play, the actor would create the performance in a process of working with that text. The text is authored by one agent and then, through a process, made into a performance. The term 'author' can be applied to an agent producing an idea that shapes or directs the compositional input and sounds that actually constitute the work in performance. As a term it indicates an idea in the work and leaves space for the creative input made when the performer works with that idea and on the sounding materials. The authorship of the work is in the nature of the software-generated framework for the performer, providing opportunities for responses and some

control over the direction of the creative work. As discussed in Chapter 3, use of the terms ‘composer’, ’author’ and ‘performer’ in many of these case-studies is dependent on a particular structuring of the practice and the outcome in the performance.

5.1.4.5 Identity in relation to the musical work

To identify the roles of the different agents involved in musical production is a task that engages with the notion of the musical work itself. An understanding of what constitutes a musical work is concerned with compositional and performative factors. As a number of works presented in these case-studies are characterised by different configurations of these factors, there is scope to try and understand how the notion of a musical work is understood. The relationship between their roles is also dependent on how a musical work is constituted, a topic discussed in Chapter 3 in relation to what is understood by the term ‘musical work’.

5.1.4.6 Boundary of performance

Understanding how they are located in the work also helps understand the dynamic between their different inputs. Harley suggests that ‘the performance is a process occurring at a determined spatial and temporal location’ (Harley, 2016, p335), placing the agents in a location that encompasses both the physical and mental processes of making musical work; Harley refers to an ‘ideal boundary’ of score and performance (ibid., p336). As well as a physical location, this idea supports the notion of a locus for the musical event, in which the roles of author, composer and performer are present, though as Ingarden writes, ‘the work and performance are not all one and the same’ (Ingarden, 1986, p. 7). Assigning roles has to be considered in the context of what is understood by the term ‘musical work’, it is not only understood by configurations of the score, preparation and performance. As he states, ‘processes that produce performance do not produce the work itself’ (ibid., p18), and ‘the work is identical neither with the score nor with a performance’ (Ingarden *in* Harley, 2016, p.337). The separation of the musical work from the agencies of the score and performance allows the author, composer and performer to be considered for their part in realising the musical work; as a ‘work not identical with its performances’ (Ingarden, 1986, p.21) but as a unique entity that has possible performances.

The enquiry starts with details of the practical siting of the work, with its software, instrumentation and instructions. Understanding the functioning of the software and the process of engagement by the performer in this work leads to a discourse concerned with authorship and identity.

There are compositional instructions initiated by the software, such as the speeds of the pulses, the stop/start triggering, and a sense of a challenge for the performer to propose materials that respond to the software. Most of what is heard is generated by the performer in their task of responding to their choices and those of the software. The performer could choose to not use the 'trigger-bar-pulse' by avoiding it, but this can be tricky in an open improvisatory context. As the performer continues to work with the software and rework their relationship to its output, compositional judgements are increasingly exposed and revisited.

5.1.4.7 Presence of the author and performer

The software framework establishes the presence of the author and the performer establishes a sounding realisation; both contributing to a collaborative performance. The work would not exist without the vibraphone performer and would be a very different work in the hands of another performer. To illustrate how different the performer's choices can vary the outcome in the performance there is a second recording (Track 6) in Appendix 1. The selection of different pitches and pulses produces a performance that contrasts with the first recording (Track 3). The software is also making a different contribution, on account of its control of the pulse speeds. Even with a lot of practise, the triggering is not consistent and the selection of tempo for the pulses is randomised. It also interesting to note that there are other differences concerned with dynamic and timbre, placing the performer in different musical contexts. The pitch and rhythm qualities of the electronic part encourage the live performer to respond in a different way. The possible variations have many possibilities, as repeated actions with the same configuration produce different performer responses.

There is also a sense of the author being present in the live performance, as there are sounds present that respond to the live action and are the result of another

participant's choices. The author is present as a 'virtual' performer who re-directs the live performer's input. The space for the author is away from the physical space, the connection between them is the code of the software. The sound of the piece includes directions made by the author, and decisions by the performer with start/stop and pulse actions. The voice of the author is present in the sound of the software generated materials, as a composer directing the framework of the composition.

There is no prescribed duration for the work and the changes made by the performer are not directed at any point. An open time-frame for the compositional content of the work is constructed within the MaxMSP software. Thus this musical work does not obviously conform to a conventional structuring of 'beginning-middle-end' that is a feature of many aesthetic practices including performance; a structure that goes back to the idea of 'wholeness' proposed by Aristotle for Greek drama (Aristotle, 2018, p.19). The choices offered to the performer indicate an opening or offer by the composer to the idea of making their own choices and having some agency in the composition of the work. There is an implied change of agency by both composer and performer. If the conventional understanding of the 'composer' is as the producer of a set of instructions that direct the performative actions in some detail, then this work strays from that paradigm. The overall concept for the work has been authored by one person, who then shares the compositional and performance outcome with another. So there seem to be two subjects present in the making of this authored work, both as composers and performers to different degrees, with their own identities, spaces and contributions.

The collaborative nature of the working relationship between them enabled a development of the work, and the sound-making component of the software was doubled, at a suggestion by the performer, to create two trigger-bar-pulses working independently at the same time; so two different pitches and pulse can be heard at times in the work. The piece 'Skin' became 'Skin Doubled'. The vibraphone performer was able to determine a new configuration of the initially authored software.

The authorship of the work is still identifiable, though the work is d reconfigured as a double version of itself. The performer has an increased compositional role by increasing the impact of the choices of pitches, rhythms and other sound qualities. A changed balance between authorship, composition and performance emerges as we

consider the production of the work. The identity of the work and the identity of the makers of the work are made explicit, in a process of a compositional practice from both of the agents being present in the performance. The musical work is defined in its structuring and realisation, by the relationship and endeavour of the contributors, and can be understood as an acknowledgement of the process of making performance together. The topic of identity, in relation to the compositional and performative elements of a musical work, is returned to later in Case study 3 of this chapter.

The next musical work in this set of pieces for case study 5.1 uses a similar configuration of instrument and technology but establishes a very different musical practice.

5.1.5 Island of Silhouettes Ruta Vitkauskaite

Track 2 /Appendix 1

https://soundcloud.com/simon-limbrick/2-islands-of-silhouettes-composed-ruta-vitkauskaite

Instrumentation: Vibraphone, microphone, Max4Live software, laptop, sound interface, stereo sound diffusion.

Islands of Silhouettes was created by the composer Ruta Vitkauskaite for the vibraphone, after an initial demonstration and discussion about some of the technical and musical possibilities available on the instrument and the potential for a new musical work. A notated score that sets out the entire work, and a separate part for the performer, using conventional musical notation, were produced by the composer. The score identified and directed the musical materials, including the desired outcome for an electronically produced variable delay. Using an idiomatic approach to the instrumental notation, the notation was precise enough to start working towards a performance.

This work addresses ideas concerned with technique, virtuosity and an evolving relationship with electronic and instrument technologies. This work is the basis for an enquiry into the performer's capacity as an interpreter of the instructions given by the

composer. It considers how topics such as technique and virtuosity contribute to the resolution of the work in a musical performance. The pitches, rhythms, dynamics and pedal markings are notated in the score; as are the structure and resultant effects of the audio delay part. A notated live vibraphone part is treated and layered using different modifications by the delay line. A screen-shot of the Max4Live patch can be found Patches/Appendix 2

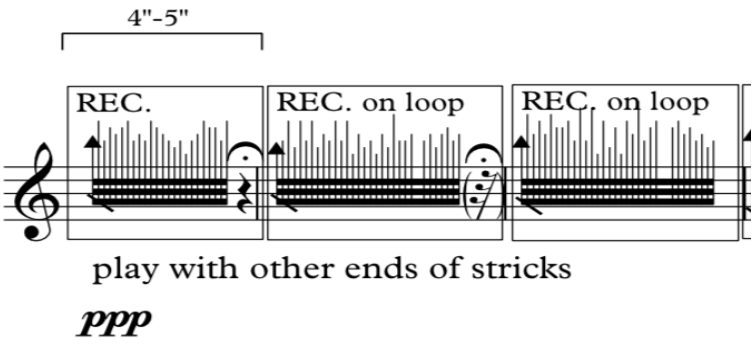

Fig. 5.1 Silhouette Looping/Delay indications

5.1.5.1 Virtuosity and technique

Initially, the work for the performer in a piece such as this is to learn to play the musical material - the pitches, rhythms, dynamics and structural elements such as repeated sections. Other directions that are not always clear in the score, such as sustained notes, pedalling and damping need some experimentation with pressures, sticks and other actions on the notes. These are techniques that the performer has developed and are dependent on experience and skills from a period outside the time-scale of this work. The performer also needs to develop or adapt techniques especially for the demands of the work. Techniques such as stick-damping are dependent on the musical context, and the performer's experience draws on a range of musical contexts that use that technique. Stick-damping owes much of its development to musicians working in a jazz context, and most of the advanced techniques have come from jazz players such as Gary Burton, David Freidman and Mike Manieri. A performer with good knowledge and close experience of the playing of these musicians would bring that experience to use of the vibraphone in another context, such as this work. Here the virtuosity available is a result of experience and study of music from a different musical context. The recent history of the instrument means that techniques are drawn from across many musical contexts and the jazz-based

technique is itself a modification of a damping technique used on the metal-barred gendér and other instruments found in Javanese Gamelan music (Sorell, 1990).

5.1.5.2 Interpretation

'Islands of Silhouettes', notates the use of resonating and damping as a result of the initial rehearsal between the composer, performer and instrument. There is a virtuosity in the playing of the pitches and rhythms, with a skilled dexterity needed to play fast passages and to move effectively across the instrument; this is a more familiar understanding of a virtuosic playing technique. In this work, it is the virtuosity that brings in other skills and adapts techniques from other music contexts, that presents another degree of virtuosity. The contribution of a range of damping techniques and that are both notated and used by the player to interpret the musical material is a virtuosic turn that can be considered a development in the player's presence in the work. A comparison with a performance that used the notated damping, which is in itself a result of the player's contribution, would sound very different. The sounds produced on the instrument would be less nuanced in their phrasing and sustain. The use of such techniques is not commonly used in the playing of the vibraphone in new music. Music for this instrument is often written as for the piano with a keyboard that is struck and sustained with a pedal, even though the bars are directly accessible and can be independent of the pedal. There are examples, such as the notated damping in Boulez's *Le Marteau sans Maître* (1953/55) and *Dérive 1* (1984), but the distinctive sound possibilities of stick-damping are available to players who have experience with its use in, or contact with, other musical contexts.

5.1.5.3 New instruments

This work reveals the development of another set of skills that some performers have incorporated into their practice. These skills are concerned with the integration of new musical technologies into the instrumental configuration, interaction and sound production of their output. These skills are focused on the use of new instrument technologies as well as new electronic technologies. The performer has to engage with the continued development of the vibraphone. There is a virtuosity in being able to adapt to these changes. A short description illustrates how they impact on the player's practice.

5.1.5.4 Instrument technologies

The development of the vibraphone has continued from the 1940s into the 21st Century. Early changes were focused on the use of aluminium alloy for the tuned bars, in order to make the sound mellow or softer than the previous use of steel. The foot damping mechanism was made quieter and more consistent, and the control of the motor that creates a vibrato or flutter effect was made more controllable and easier to use. The improvements in the motor speed control have meant that it is possible to start and stop it with a light touch, and the speed can be varied whilst playing. The alloy used for the pitch bars continues to improve as metal technologies and tuning systems develop. It is possible to choose the harmonic structure of each note of some models. These developments have changed the sound significantly over the last 20 years and a performer has to change their playing technique in order to have control over the sound.

The evolving design of the instrument is one example of a new technology. Another is the integration of new electronic music technologies. Ideas concerning electronic technology appear throughout this research, as a domain that has an influence in many of the conditions informing musical performance. In this case-study, electronic music technologies are used to extend and contribute to the main instrument. The use of these components, the programming of software and their integration into the performing space are the responsibility of the performer. The ability to use these components is an example of another virtuosity. The knowledge of how they operate and the skills needed to make them function are examples of a learning process and a dexterity that requires practise, ingenuity and experience, as in any other virtuosic action on an instrument. The technical requirements required for this work provide an insight into this extension to the skills of a performer.

5.1.5.6 Delay

Islands of Silhouettes requires the sound from the vibraphone to pass into a delay processor. The sound is conveyed via a microphone into a laptop that uses software to process the sound. The software is *Max4Live* and two pieces of software working together. The *Max* part is a version of *MaxMSP*, a programme that allows the construction of ‘patches’ that manipulate and create sounds. A ‘patch’ has been made that allows any

sound passing into it to be played back according to delay parameters controlled by the performer. The delay for each section of the work could be possible on a stand-alone delay box, but this piece requires some quick changes of the parameters to be done, whilst the performer continues to play on the vibraphone. Any sounds from the operation of an external box would interrupt the flow of the piece. The performer constructed a patch in the software that allowed the performance to continue with the delays and repeats controllable without any disturbance in the flow of the music. The design and functioning of this delay was entirely done by the performer. There is a virtuosity here in the understanding of all the parts of the technology and being able to make them work in a performance.

5.1.5.7 Algorithmic software

The next musical work is again for vibraphone and electronics, in the form of a *Max* program on a computer that plays material for the player to respond to. There is no amplification of the vibraphone only the electronic part. The instructions are clearly stated in text form, explaining how to react to the electronic sounds for three distinct sections. Within the structure of these instructions - 'play short separate notes', 'play a legato melody' ,'play chords' - the player has to respond to the pitches and rhythms being generated by some complex random processes. The duration is fixed.

5.1.6 AlgoVibes Angus Stewart

Track 1 and 8 /Appendix 1

https://soundcloud.com/simon-limbrick/1-algovibes-composed-angus-stewart

Instrumentation: Vibraphone, Generative algorithms, Max4Live software, laptop, stereo sound diffusion.

This work addresses ideas concerned with physical/virtual space and temporality, as well as interpretation. A screen-shot of the Max4Live patch can be found Patches/Appendix 2

The performer can utilise any techniques that meet the requirements of a short set of written instructions. There is a 'patch' in *Max4Live* that is programmed to produce three sections of sounding materials over a given time period. The sounds are very simple sine-waves that have changes in pitch and rhythm according to a structure of randomly triggered operators in the software. The speed and density of the sounds vary according to which of the three sections are playing. The nature of the randomising factors means that the rhythms and pitches are always changing and never repeat themselves. The sine-wave sound is sustained and gentle, with the occasional digital 'click' that characterises its simple computer generator. The performer understands the duration of each of the three sections and attempts to follow and react to the sounds from the computer.

As the performer listens and plays, the nature of the computer-generated part is such that it controls much of the movement of the sounds. It is difficult to play outside or against the electronic part without it sounding out of place. The structure is also fixed, the changes to each section happen where they have been fixed by a timer. The three sections each have a text direction for the performer: 'four note chords', 'single melody line', and 'two rhythmical lines'. The interest for the performer is to work around the electronic part in quite a subtle way and find a way of playing along with the random selection of electronic material. As the performer practises with the electronic part, there is a process of learning and attempting to predict the changes. This would seem impossible because of the randomised factors in the piece, but as the player concentrates and becomes familiar with the possibilities, the reactions improve and there is a balance of the two 'voices' in the work.

The ability to adapt musical skills, in order to perform within a technologically enabled musical framework such as this, is evidence of the changed skills of the performer. The practice evident in this example is changed to the extent that it incorporates a new practical relation with technologically activated sound materials. This change can be understood as part of a new virtuosity that includes the ability to work closely with technologically produced rhythms and pitches; to be skilled enough to perform in a context that is unpredictable and mechanically regulated. This contrasts with a conventionally scored musical work, which, though regulated in its appearance and possibly directing the performer towards random choices, is set out visually in front of the performer. The immediacy and mechanical nature of the software generated material contrasts with the

processes of a performer thinking and attempting random choices. It could be said that the performer's ability to work with technologically produced events is a feature of musical virtuosity.

5.1.6.1 Sounding space

Two aspects of this piece can be used to address ideas about spatiality in musical performance and temporality. The first is the idea of the activity as it unfolds directly and is happening and sounding in the space. Harley suggests, 'The whole process of music takes place in the actual space, in which the sound and the perceiver of the sound necessarily exist' (Harley,1994, p96) which locates the sound, the performance activity and the listener in the physical space. This is the situation for the work addressed here; it is taking place within and the sounds produced interact with acoustic properties of the location. Whether the qualities of the sound are directly related to the immediate location or organised in some other way becomes the subject for further study later in this chapter. Harley's view that 'music has always been spatial' (ibid., p100) is close enough to the situation for this work and enables a detailed look into its operations.

The sounds in this piece are simply produced; there is a sine-wave sound and the sound of the vibraphone being played without any amplification. The electronically produced part is diffused as a mono signal and the vibraphone is unamplified. This simplicity allows for the acoustic properties of the physical space to come into the sounding world of the piece. There are many categories and descriptions of space available from the canon of electronic music theory, and from a comprehensive list found in Juha Ojala's *Space as Musical Semiosis,* many could be applied here, such as diffused space (Smalley 1991), external space (Smalley 1997), information-sound space (Barrass, 1996), instrumental space (Emmerson, 2007), composed space (Smalley, 1991), compositional space (Morris 1995) (*in* Ojala, 2009, p345). The composer of this work intended a simple but controlled sound space. Understanding how to deliver that space and operate within it is the task of the performer. The performer has a responsibility to locate the work in a space that is part of the score-text. The control of the performance space has become part of the domain for the performer's activities.

5.1.6.2 Sustained tones

The vibraphone produces a sustained sound that mixes with the electronic sine-waves, the slight difference in tuning produces subtle but clear 'difference tones'. The acoustic and electronic sources produce sound reflections, flutter and interference as properties of the physical space, as a result of its surfaces and materials. The space itself contributes to resonances and combinations of pitches and, without using a complicated sound diffusion setup, the piece incorporates the performance space into the composition. Movement of the sounds across the space produces micro-changes of pitch. It is useful to compare this setup with some more complex configurations of sounding instruments. Different approaches to the use of sound spatialisation as a component of the musical work are explored alongside their integration into the performer's practice. This composition includes spatial directions that the performer includes as part of their performance activity; a situation that is reviewed more extensively in the works, *Points* and *A First Show*, later in this chapter.

5.1.6.3 Time in the work

In discussion with the composer, it became clear that the piece starts and ends over an extended and variable amount of time. Although the internal sections are changed with a timer in the software, the piece gradually starts and returns to silence. The idea in the work is that the start and end are not important aspects of the work. The performer joins the electronic part when they choose, starting and ending gradually. The focus of the work is the performer attempting to play with the sine-wave sounds.

5.1.7 Points Simon Limbrick

Track 4, 5, 6 / Appendix 1

Instrumentation: Vibraphone, microphone, Leap Motion Movement Sensors - MAX programme, laptop, sound interface, 4 way sound diffusion.

This work addresses ideas concerned with the presence of the audience and 'liveness' in the context of a dynamically controlled sound space. A screen-shot of the Max4Live patch can be found Patches/Appendix 2 

The practice in this work falls under the three headings, *practice, technology* and *community*, as they can be applied to three following components: the pitched and rhythmical materials played on the vibraphone, the manipulation of the instrumental sounds, and the movement of the software manipulated sounds around a diffusion system that fills the entire performance space. The audience are free to move around the space and negotiate their own way of listening and observing the actions of the performer.

As the performer plays the vibraphone, they are also able to interact with a sensor (LeapMotion), that can convert the movements of the sticks inside a three dimensional space, about one cubic metre above the instrument. The movements can also trigger the sampling and playback of live sounds, via a microphone, from the vibraphone. The movements can also change qualities of the sounds, with the possibility of pitch-bending and filtering. The sensor is highly sensitive and there is considerable practise and calibration needed to control the software. At times there is a sense of 'hysteresis' as the triggering and manipulations react to very fine movements with the sticks.

5.1.7.1 Musical object as score-text

The three layers of control in the musical work are synchronised by the musical demands of the score. There are patterns of pitches and rhythms that can be chosen and which cause a particular set of physical movements in the space immediately above the vibraphone. These fragments of chords, melody and rhythm are identifiable components of the score; they are reused, modified and have a sustained presence in the musical duration of the piece. There is a counter to these musical objects, that exists in the other two layers of activity. The second layer controls sound sampling and manipulations, and these can be used as instances that produce sounding material on the instrument below. A third layer makes it possible to perform the work by controlling the movement of the sound around the space, and the movement produces another set of sounding objects on

the vibraphone as a result. The interaction or interference between the three layers constructs the score-text for the musical work. The duration of the work is dependent on the performer negotiating a path through the layers and producing moments where they contribute to each other for a brief period. The resulting performances can vary enormously because of the unpredictability of the algorithms.

5.1.7.2 Responding to the audience within the musical score

The third layer of the work allows the performer to move the resulting sounds around the space occupied by performer and audience. The performer can respond to audience movements and engage with their responses. The musical work promotes an engagement from the audience, by inviting them to move around the space and choose their own way of observing it. In this work, the ability to move the sound around the space also opens up the possibility for a different relationship to the performance by the audience; the sound moves and so can the audience. The audience can move and discover how the performance can be perceived from different positions in the space.

The idea that there are other approaches to engaging an audience in a performance is not new. In other musical genres and contexts, such as Rock Music festivals and Dance Clubs, the audience is encouraged to engage through all kinds of strategies by the artists and promoters. In the context of Classical music performances, alternatives to conventional seating arrangements and unusual venues are used to engage audiences into different behaviours. There are attempts at other configurations but the unbroken and undisturbed performance of the music is the dominant feature. Performances of musical repertoire regarded as more experimental or related to other art disciplines offer a wider choice of performance circumstances. Associations with the fine arts or different performative art forms such as dance and theatre, brings music performance practice into the spaces used for those disciplines. These spaces offer a different framework for performance that allows the audience and performer, to discover alternative ways to position themselves, in relation to each other and the performative actions. Various performance contexts of ballet, film, installation and others, that exist away from the conventional concert hall, have historically provided the opportunity for new forms of music performance. Well-known examples, amongst many others, include the occasion of the premier of the Stravinsky's 'The Rite of Spring' (1913), which changed the course of

orchestral music writing, or Alvin Lucier's 'I Am Sitting in a Room' (1969)[41], which placed the performer into a space that was both a technological construction and an art installation.

The physical positioning or mobility of the audience can also be understood as an attempt to encourage the audience to listen to the work in different ways. It is useful to consider how ideas in theatre have addressed the role of the audience. Bertolt Brecht devised techniques in order to change the way the audience engaged with what he considered had become 'culinary theatre'. Although these devices stimulated the audience to become less passive, they were yet to take them out of the theatre seats, though his description of the audience seems to coincide with that of some classical music audiences, 'their eyes are open, but they stare rather than see, just as they listen rather than hear' (Brecht *in* Freshwater, 2009, p47). Brecht was writing in the 1940s and contemporary theatre has experimented with different modes of audience engagement that have become a regular feature for many theatre companies. Theatre practices have developed to the point where 'there are signs that theatre can provide meaningful forms of audience participation and engagement … trusting audiences and offering them real choices' (Freshwater, 2009, p76). Musical performance has adopted some of these modes, with festivals such as Brighton's 'Colour Out of Space' allowing the audience to move around the performance spaces. Performance of music that addresses a fundamental rethink of the conventions and concepts of contemporary music is sometimes better located in an environment where such thinking is prevalent, such as an art gallery or industrial warehouse. The mode of engagement by an audience at an exhibition of large three-dimensional artworks, as they move around the objects, is adopted for a new music concert. In *AlgoVibe*, the first piece in this case-study, there was some discussion about the effect of the distance and movement in a space on the qualities of the perceived sound.

Although writing about the theatre, Rancière considered the relationship between the performer and the audience when he wrote 'the place where action is taken to a conclusion by bodies in motion in front of living bodies that are to be mobilised' (Rancière, 2011, p3). This is the place where the audience are 'reactivated … in the intelligence which constructs the performance, the energy it generates' and this new performance acts 'on

[41] https://www.moma.org/explore/inside_out/2015/01/20/collecting-alvin-luciers-i-am-sitting-in-a-room/12/10/2020

this active power' as it is 'restored to its original virtue' (ibid.p4). As proposed in Chapter 4, the language and critique of theatre offers a purposeful method for understanding performer/audience relations. The potential for music to respond and engage with a physically dynamic audience creates the possibility of an evolved engagement between the participants of a musical performance.

5.1.7.3 Mediated sounds

The sounds for this work are present as acoustic phenomena, and through the media of the software processing and sound diffusion. The sound information is heard via different signal routes. The acoustic sound is the direct sound from the instrument and is visibly coincident with the striking of the notes. The electronic sounds are a combination of treated and sampled sounds picked up by a microphone. The operations of the software cause these sounds to be broken down into low or high filtered sounds, or pitch-shifted. The latter are sometimes small glissandi that can sound similar to the original instrument but made remote and unusual by the movements with the Leap Motion. The electronic medium presents a very different version of the vibraphone to the listener. This is an example of how an interplay with the real/live relationship can be constructed as part of the live realisation.

To create a multi-layered performance score, as used in this work, requires a detailed understanding of the programming software. The possibility that the performer can access the technology and level of programming is not necessarily a recent development; live electronic performance goes back to projects like the 'League of Automatic Music Composers' (1978-1983). The difference is that the technology is much more accessible, standardised to some degree, and supported by a community of users. The technology is also part of a changed instrumental configuration for the performer. The setup for this work allows the performer to control the entire sound production for the performance, using the physical movement of the diffusion as a component of the score.

5.2 Case study 2

5.2.1 'Re-Location'

Research Project – Locative sonic performance

Jonty Harrison, Sound score/diffusion, Simon Limbrick, score/environmentally-resourced percussion.

This work is included to address a number of topics that inform the performative locus. As a performance work it incorporates many ideas that have been reviewed in the works of Case-study 1. The work can be seen as an attempt to develop these ideas concerning evolved performance practice into a compositional work. As the topics have been discussed earlier, the writing in this case-study will only be concerned with further observations that develop the research. The topics addressed are those that come under the heading *Community*, such as the relationship between performance, performer and audience, 'liveness', and temporal and spatial components. The technological nature of the work also means that there is some discussion around mediation and communication.

This work was made as proposal to a number of festivals and venues, including the Huddersfield Contemporary Music Festival, Mexico Festival and Montpellier, France. Research and development was undertaken to the point where funding applications were made to the Leverhulme Trust. Eventually the work was not continued, as funding was not available for the ambitious nature of the work. It is included here because it engages with many of the topics related to an evolving performance locus. It is valuable to look at the production research to understand the feasibility of making such a work. For these reasons there is no audio documentation.

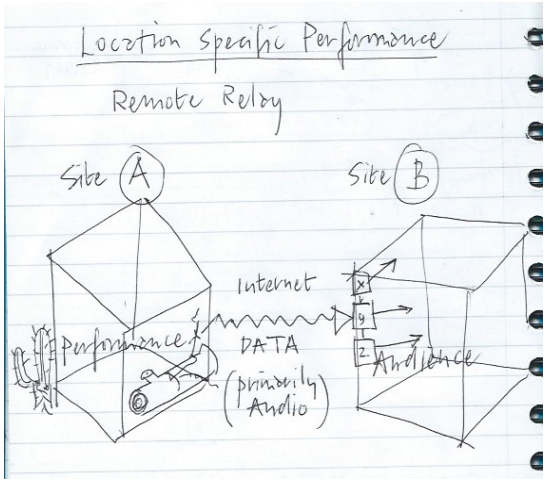

Fig.5.2 Planning sketch- spaces and concept for *Re-Location*

5.2.2 An outline description of the work, *Re-Location*.

The performer and the audience occupy two different spaces connected by digital communications technology. The audience have a sonic experience of the environment occupied by the remote performer. Sonic and compositional processes combine to explore and define a given space utilised by the performer. The sonic information, in the form of digitally transferred audio signals, is combined with studio-made materials based on environmental phenomena that inform compositional directions for the performer, creating a form of organic feedback where the two sets of materials inform each other. The studio materials provide indications for the performer's actions, including articulation, dynamics, duration and frequency-based information. The sound processing, mixing and diffusion are carried out in a place designed for an optimum audience listening experience, in order to recreate the environmental and performer actions from a remote site.

The intention is to find remote sites for the performer that produce strongly characteristic materials, including nature-rich outdoor locations and urban environments. The audience should have a sense of the remote environment. Jonty Harrison added to this description, to support the technological and electronic music component in the work, '*Re-Location* investigates and develops compositional, collaborative and performative practices that engage with locative sound materials as a primary component, leading to a new mixed/live (yet simultaneously acousmatic) electroacoustic work.' (Harrison and Limbrick, 2017)

From this description it can be seen that the relationship between the performer and audience is one of the key factors in the scoring of the work. The fact that there is a large physical distance separating the two spaces is necessary because it challenges the nature of presence for the audience and performer. Any perception of the performer is only available through the sound materials that are mediated through the technologies. This mediation is controlled as part of the work, so the sound materials can be used as part of the performance. One challenge for the listener is to interpret the sound materials, knowing that they are from a performer playing 'live' in another real space. The audience are engaged in a new way of listening to the other space; they are structuring the space using sound and listening to it in their own space. The sound is manipulated by a

performer, Harrison, who is in the same space as the audience; the audience can see him and hear the results of his control over the sound.

As Harrison states, this is an acousmatic sound performance with the source of the sound production out of view in another space. The audience have the experience of an electronic acousmatic performance with the knowledge that there is a live sound source interacting and responding to their presence in the work. The nature of composition is based on the notion of an evolved musical practice; the performer is aware of the audience and using new skills with technology and audience engagement to provide sound information back to the audience space. The idea of presence and encounter has been discussed and it is used here to understand the relationship between the performers and the audience in this work. The sound data passes through different media and is restructured for the audience, as there is a continued awareness of the presence of the participants at each end of the work. The sense of presence and encounter is a factor addressed by the musical work. The ideas raised here are constitutive of an evolved performance practice.

5.3 Case study 3

5.3.1 A First Show Dominic Muldowney

Video extract Appendix 1 https://youtu.be/Gy91-TUZdZ4

Instrumentation: Vibraphone, Marimba, stereo audio playback

This work addresses the topics of virtuosity, technology and audience and attempts to develop these as conditions of the locus for performance.

The work uses a theatrical lay-out of a vibraphone and marimba, with a physical walking space in between. The musician performs alongside pre-recorded material that is clearly set out in a notated score. The pre-recorded sounds consist of doublings and variations of the live material for the instruments, and sound-effects or 'foley' sounds of a performer moving around a 'distant' space. The live instruments and electronic playback create a space in which there seem to be two performers, though one is not visibly present. The live performer responds to the actions, such as footsteps and instrumental playing on

the recording. The theatre of the performer in the live space is matched by a recorded theatre space with its own acoustic properties.

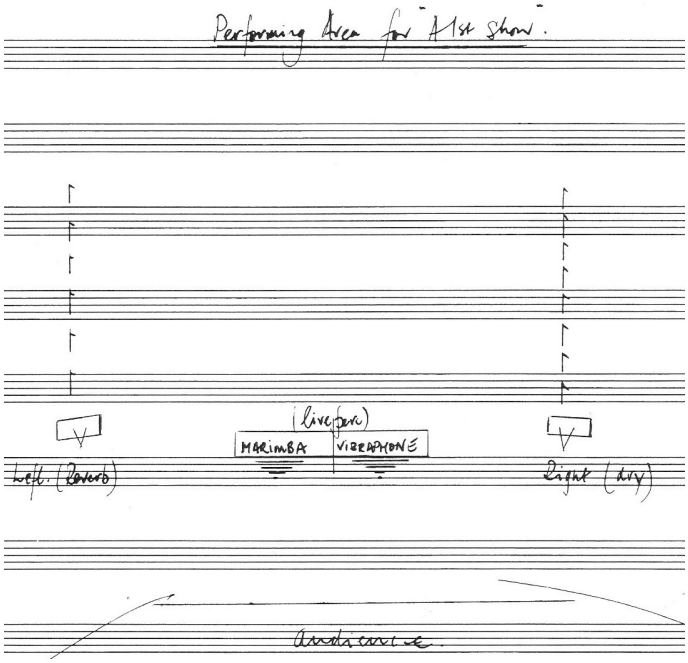

Fig 5.3 The layout of the performing area showing the relationship to the audience. Reproduced with permission of the composer.

The notated score directs changes to some of the sound treatments of the recorded soundscape, with different sound materials overlaid on each other. The recorded material is multi- dimensional and uses reverbs and delays to create a sense of depth, as if a performer is moving in and out of remote spaces that have different volumes and reflective surface. There is a tension between the live and recorded elements of the piece, as the sounds combine in the live performance space, and this is evident to the audience, who are themselves present in the acoustic of the live theatre. The live performer, present as the focus through the live action, is the link between the different sounding materials. Through the action of performing the work, the performer brings the two domains into contact; the 'other' world of the recorded soundscape and the theatre occupied by the audience. The layering and interaction of the different acoustic spaces is a feature of the musical work. The piece lasts approximately 15 minutes.

The work is built around the technological configuration of the recorded parts, the layout of the instruments and sound in the auditorium. A key point to be made here is that the technological element of this work was entirely lost since its publication in 1978. The publishers no longer had a copy of the work and had given up maintaining the electronic component. The work was therefore no longer available. The performer (Limbrick) remade

the electronic part and worked with the composer, Muldowney, to reinstate the work. As a result of this action, the work can be performed again.

As well as a reconfiguration of the performer/ audience relationship, this work also identifies the development of new skills for the performer. The performer was able to recreate a complex electronic component of the work with the use of technologies that are now easily accessible. The original version was made in a recording studio especially constructed and equipped for that purpose, and the reconstruction was produced with a software, laptop and microphones. This work serves as an example of how the performer's role extends into the use of technology, enabling reversal of the loss of musical works. The performer is also an archivist, able to reconstruct works with new technologies.

5.4 Case study 4 – Three mixed-media works

The three works in this case study are characterised by their use of images that are controlled or integrated into the score by the performer's actions. The production of the detail and the rate at which the process unfolds are integral to the function of the performer playing the instruments. The processes to produce this activity are quite different and require different skills and musical input.

5.4.1 Islands Ed Kelly

https://soundcloud.com/simon-limbrick/2-06-islands-o-part-1-o?in=simon-limbrick/sets/relay-contemporary-steel-pan

Instrumentation: Vibraphone or steel pan, generative software Pure Data, laptop, projection screen

The musical practice in this work leads to a development of ideas discussed in previous case studies of this chapter. The structure of the compositional elements and the performative input are built on a collaborative working relationship with the composer that has continued for over nearly twenty years. The intricate nature of the technological engagement with live programming, instantaneously produced notational score and

changes of instrumentation are all indicative of an evolved notion of performance practice. The following is a description of the musical work from the composer, Ed Kelly.

Notation

The Islands notation patch for Pd, creates collages of atomized sections of score fragments governed by an algorithm, whereby fragments of a linear score are displayed one after another in performance time, with local randomization governing their selection.

Audio Patch

> *...a further atomization of the material, whereby the audio output of the performer is continuously recorded and re-organised, output as sequences of audio events processed by effects informed by parameters of the contemporaneous audio and score, and parameters from a second performer. (Kelly, 2019)*

The list of conditions and parameters that have been applied separately to all the previous works in the case-studies, can be used in this work. As their functioning has been discussed in some detail already, it is appropriate here to focus on the ideas that contribute further to the research in this chapter.

The musical work is identified by the notated score and the procedures of the software patch. The instrument performer inputs musical material, elaborating and improvising around the notated material. The notation only appears for a brief moment on a computer screen, so the performer is continually being presented new material. The presentation of the notated material and the responses of the software are affected by the live playing of the performer. The software will respond and produce materials even if the second performer is not participating. In performance the notation screen can be projected in the space, so that the audience can see the continuously updated score. The software is feeding back material to the performer based on their input, although the programming is too complex for the performer to predict a particular outcome. The composer is present in the operations of the software and the performer is causing materials to return and be manipulated. This is a similar arrangement to the other musical works in this chapter that use responsive software to frame the performer's actions.

In this work, the complexity of the interaction makes it difficult to predict any outcome and the performer has to improvise and negotiate an intricate and evolving score, using the notation and the sounds produced by the software. The activity is neither a precisely notated score nor an open improvisation; both disciplines have to feed into and work alongside each other. This is a good example of highly developed interpretative skills, and virtuosic in its movement between the different modes of performance. The work has been performed in conventional concert stage/seating configurations and open plan art gallery spaces. The sound diffusion and placement in relation to the audience can be reconfigured for any space that contributes its own sound qualities and modes of audience engagement. The main acoustic instrument can change and currently there are versions for vibraphone or tenor steel pan. The audio documentation accessed through this research is for steel-pan and from the CD, 'Relay' (Limbrick, 2013)

5.4.2 The Five Bret Battey

Instrumentation: vibraphone, voice, footswitch, MaxMSP/Processing software, laptop, projection screen

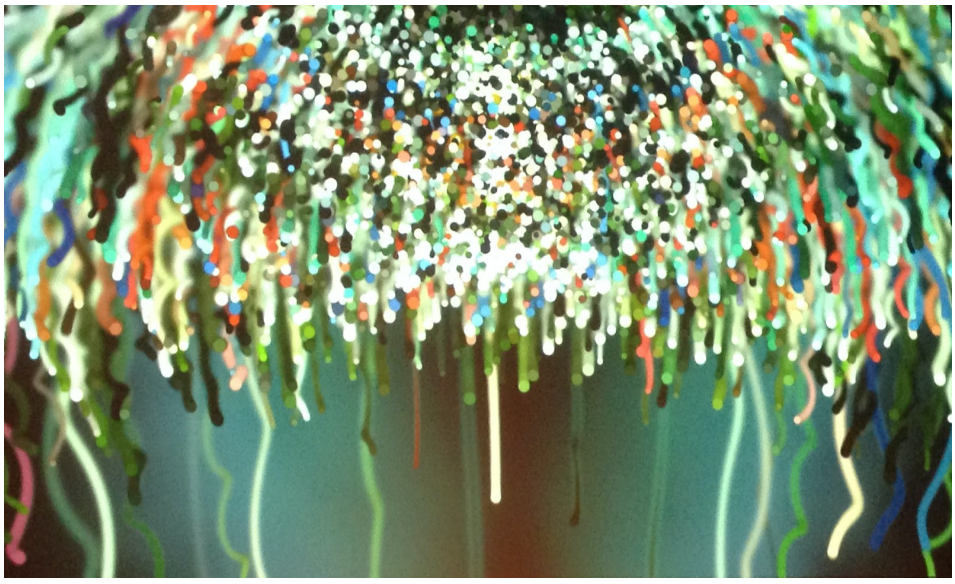

Fig.5.4 The Five : Photo of projection screen image produced by performer (With permission of the composer. Photo: Bret Battey)

The performer works through a notated score that includes conventional classical notation and other information to enable the generation of a continually evolving projected image. The pitches, rhythms, dynamics and pedal damping are indicated in the

score. Above and below this notation is information for the voice, including spoken texts, and footswitch indications that are used to set the speed of the subsequent music and the changes in the projected image. Sometimes two feet are used to affect the necessary changes. The performer has to operate precisely against a timeline and produce the correct timbres and interpretation of the notated score.

There are a few points of interest in regard to the list of conditions and parameters used throughout this chapter. There are techniques and skills used that are beyond the requirements of playing a single acoustic instrument. These are not only concerned with the control of technology or the multi-layered nature of the sound and control. The performance requires a sophisticated knowledge of how the different components work together in the work whilst able to produce a musically coherent score on the main instrument (vibraphone). The performer does not have to direct the projected images except to recognise when they have changed to new sections. The process of working in this way means that the performer is confined in a technologically defined performance space which is quite remote from the audience. The connection with the audience is through the combination of the sound with the projected image; in producing the whole work. The audience has a relationship with the performer via the screen, as they watch it and listen to the diffused sounds. There are other possible configurations of performer and screen but the images have priority over the performer's physical position. The configuration is adaptable to many different spaces and not limited to a conventional concert hall layout. It could be performed in a gallery space or other configuration where the screen is visible. This leads on to the last work in this case-study.

5.4.3 Octagon Lee Westwood

Westwood, L. & Mara, S. (2013) *Octagon Square - Marimba*.

Instrumentation: marimba, microphone, Ableton Live/responsive software, laptop, projection screen

The software provides a click-track that the performer uses to synchronise with the images. By playing along to the click-track and subdividing the beat, it is possible to create different visual shapes and structures on the projection screen. These shapes only become visible when the software receives pitch information; different pitches produce different

colours and intensities of colour. As the performer plays along to click-track the shapes are filled and redefined. The intensity of the colours is controlled by the dynamic level of the instrumental playing. With continued practise it is possible to produce many interesting combinations of highly detailed images. The images fade if there is no sound. It seems straightforward; the playing controls the resulting images with a very high resolution.

The work was originally performed with an ensemble of musicians in an art gallery, where the walls were used to show large images created by the musically controlled process. The computer generated images were printed onto high quality paper and displayed. These were prints created by previous musical performances.

After the initial ensemble performances, the creators of the work were interested in a solo version of the piece in which the performer would be able to improvise to the click-track and explore different ways of working with the material. Here we consider this later version of the piece, that highlights a number of the topics that are the focus of this research. The musical work produces images, and these images partly define the musical activity. There have been performances where the instrument player faces the screen and performs a continuous flow of changing images. The audience stand around the room and the performer, watching and listening to the interaction. The changes are consistent and slow but predictable; a strike means that something will become visible on the screen.

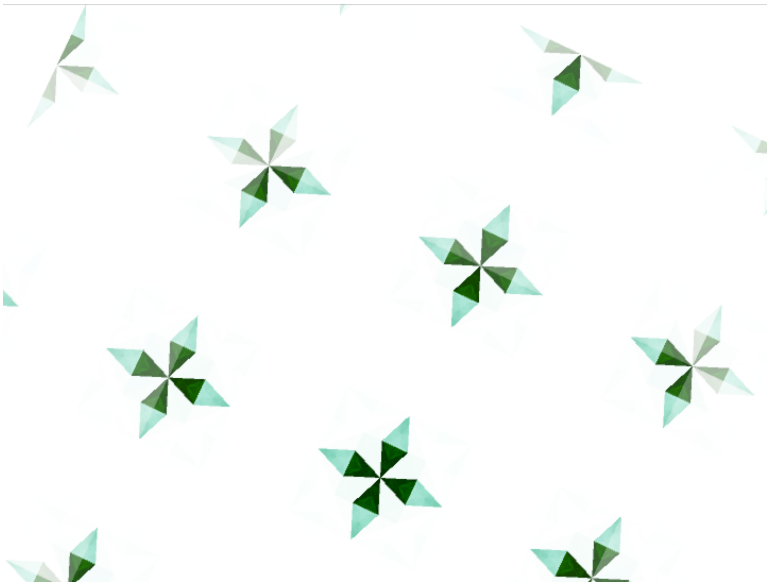

Fig. 5.5 Shapes produced by rhythm, colours produced by pitch

For the audience, there is a direct correlation in the process unfolding before them and it is happening in real-time. It is possible to engage the audience and lead them

through the transitions by shaping the music and the building of the images. It is also possible to respond to the reactions of the audience. As the activity in the space is more like that associated with an art gallery or installation, the audience are more relaxed and reveal their level of engagement through their body language and sounds. There is listening which it intensifies at key moments and relaxes when images and music are fading. This work is informed by many of the conditions that have surfaced in the enquiry into the performative locus and is an example of how the performance event has changed. The nature of the engagement between composer, performer, audience and the performing context is different to a conventional classical concert. It reflects a different dynamic in the way these roles are defined and demonstrates a need to re-evaluate the way that they are defined and work with each other.

Conclusion

To conclude this chapter, there is an attempt to set out how the different conditions and parameters that inform the performance locus can be seen in relation to each other. In placing them into their groupings and understanding how they associate and operate on each other, it is possible to consider how the relationship between the performer and the audience has changed, what informs that change, and where there is any friction or disconnection. The image below uses the three headings in this chapter and sets out the conditions based on the evidence in the musical work. It illustrates some of the relationships and the prevalence of certain topics over others.

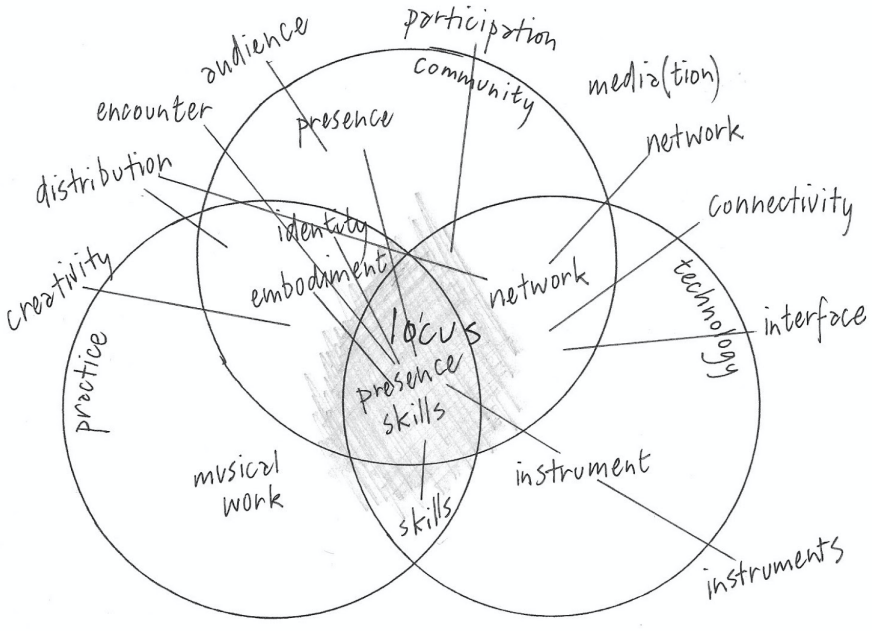

Fig. 5.6 Conditions and parameters located in this chapter

A methodology used to investigate the complex nature of the performance locus was to isolate some of the affective elements - a case of deciding on particular conditions over others, of testing and exposing ideas and the nature of their relations with others, whether they are entangled, relational, or co-joined. Each musical work is characterised by its own set of parameters and conditions, a situation that allows the investigation to deal with different critical viewpoints. When working on the preparation and performance of each work, it was possible to observe the key parameters and conditions of the activity and find methods for critical intervention. This draws on the methodology of *working under headings*, as set out in the Chapter 3. The key parameters become headings under which to place ideas that arise from the questioning, eventually producing a taxonomy that gives a theoretical structure to the thoughts and ideas that arise. The testing and suitability of the thinking within the practice is worked through in order to understand the conditions and to expose aspects of their change over time. This becomes evident as it is possible to select and strengthen the placing of the headings and the ideas that fall beneath them. The use of hierarchical headings, with the possibility of subsets aligning in association with each other, allows for the development of analysis and understanding that can build upwards, to create new headings, as well as collecting under them. The method of associative categories assists in articulating and understanding the milieu that conditions the performative event.

6 Architectural Spaces

Introduction

The nature of the physical spaces used for music performance, such as Concert Halls, is one of the dimensions that contribute to the performance locus. As part of a methodology that distributes the dimensions under the headings: *practice, technology* and *community,* the physical space of performance appears and functions across them all. In my practice, it is possible to engage with ideas concerned with the physical context for performance, as part of creative activity under each of these headings. In this chapter, the writing is focused on three projects from my practice that use the physical location as part of the musical score, as sounding instruments, and as a starting point for an extended production that links with distributed and networked creativity.

Consistent with an auto-ethnographical methodology, the three case-studies are taken from my creative output and are dispersed chronologically, to provide evidence of change across that practice. The three productions are 'Heaven's Gate/Sono Lux' (Dir. Harry De Wit, Amsterdam, 1987), 'Ascending Fields' (Dir. Rosemary Lee, Birmingham, 1992), and '3 Church Walk' (dir. Emily Richardson, Aldeburgh, 2014).

6.1 Inside/ Outside

'Heaven's Gate/Sono Lux' (1987). Dir. Harry De Wit/ Musical Dir. Simon Limbrick

The external and internal spaces of a building are the focus of the work, 'Heaven's Gate/Sono Lux' (1987). As a part of a celebration to relaunch the Felix Meritis building on the Keizersgracht, Amsterdam, I worked with performer/artist Harry De Wit[42] on a sculptural sound installation that functioned throughout the building and on the façade. The piece is written about in more detail in Chapter 5 to investigate ideas about the physical locations and structures for performative activity.

[42] https://www.harrydewit.info/installations

Much of De Wit's music is concerned with sound qualities, with new and unusual sources at the centre of his work. Examples are 'glass-harps', resonating stones and amplified large electric sparks. In the recording stage, I was the Musical Director for the ensemble and performed on many acoustic and electronic instruments, utilizing conventional instruments like cimbalom and marimba alongside the sample manipulation and synthesis. The recordings were created in such a way that they could be mixed together in different combinations.

The final mixes or musical strands were played through speakers throughout the building with the placement and diffusion of each strand controlled by the audience using strategically placed joysticks. Large transparent Perspex speakers were part of the configuration, allowing passers-by to place their ears literally onto the building to hear the sounds. The movement and positioning of relevant recordings were related to the idea that as the sound was higher in the building it aspired to a higher celestial sphere and heaven above earth. The music was made for the building and the different types of resonating space. The score pitches were arranged around resonant frequencies of the building. The musical materials had to be able to function within the architecture; the architecture defined the process of making the score. A feature of this work is that it is purposely created for the building. The work is not brought into the spaces from outside, either as an entire production such as a musical Opera or a concert program rehearsed in another space. Cheryl Stock has written extensively about different models of site-specificity and the description "The site is the source and not the repository" (Stock, 2011, p.1) can be applied to this work. Stock's writing also looks at the relationship between the performer and the site. Understanding how the performer is located in the performance site is useful when trying to determine the focus of the creative work. As the performer, I can be active in the site, in conjunction with the site, or, as Stock suggests, embody the site. The work is where I am located. This comment links to previous writing, where I have articulated the idea of a performance locus as being constituted by my presence in it as the performer. Stock writes,"the body as site and in site" (ibid., p.1). There is a sense where both of these ideas work together, when the performer is the centre of a creative process that is contextualised by and includes the identity of the location. This could be applied to a conventional music concert and hall, as a place of specialised activity. A performer's actions create a performance dependent on their skill and knowledge, as they embody the

activity. The performance takes place in a selected site that could operate independently of the work, or it has some influence over it. The performer's actions and the site could be related in the intention. A Classical Music venue, such as the Wigmore Hall, London,[43] is an example where of a site for embodied knowledge and performance of Classical Music, and a venue that is characterised by its focus on Classical Music. The venue and the performers work together to produce a specialised performance context. Cheryl Stock addresses site-specific theatre and dance work and her critique of where the boundary exists between the performing body and the site of the performance is useful in that it opens up a discussion about the relationship between the performative action and physical location. The examples in this chapter provide a perspective on this relationship and the implications for understanding an evolved locus for performance. The next example describes a work that seems to be the opposite of this model, a dance/music performance in an old industrial building. The performance used the site as a resource, deriving at least some of the creative materials from the site, but there are connections between the performer, the audience and the site. The work is made with a creative community that has strong connections with the social community of the previous workforce for the, now closed-down, industrial site. The context is the industrial site and the community that occupied it.

6.2 Resonance and the Community

'Ascending Fields' (Dir. Rosemary Lee, Composer/Musical Dir. Simon Limbrick, Birmingham, 1992)

In 1992, Rosemary Lee commissioned me to make the music for a large-scale work, titled 'Ascending Fields', to take place in the, then disused, Fort Dunlop tyre-factory, Birmingham. The production included Rosemary Lee Dance Company, a local community-based dance group, a core mixed electronic/acoustic music ensemble, a large community music ensemble of mostly brass instruments, a visual artist, four sound-systems, a large lighting rig and of course the enormous scale of the factory. There were hundreds of people involved and the scale of the piece was an exciting challenge. This work was a major undertaking, as I composed, rehearsed and performed the music with more than thirty-five musicians. It combined many of the skills I had developed on site-specific

[43] https://wigmore-hall.org.uk (accessed 12/5/21)

projects outside the UK, integrating composition, music technologies, performance, movement, and community-based activities, into an industrial space. This large-scale work is used as an example the use of different physical structures and buildings as locations for performance.

As with earlier site-specific pieces, I made tests of the resonant pitches and sound characteristics of the different areas of the building. I structured the musical composition in a way that was adaptable to movement around the building and to the range of different musical abilities and experiences of the participants. I took the experiences I had gained as a performer/composer in other musical context, such as studio work, as well as research into sound diffusion at City University, London, and applied them to a site-specific project. The creative sphere, shaping the musical locus and realization for the performances in such an environment, had to incorporate practices from my experience in a number of different disciplines, as composer, performer, Musical Director, and mixer of sound diffusion. Performative activity was adapted and reconfigured for a site-specific work and a new social context created around it. Part of the intention in making the work was to recognise the community that had existed when the factory was functioning. The creative activity engaged with the community, inviting them to participate as a source of knowledge, performers, and audience. The industrial site became the location for a new community of artistic endeavour and communication.

6.3 House as Instrument

‘3 Church Walk’ (Dur: 23mins. Dir. Emily Richardson/Composer. Simon Limbrick, 2014)
Short clip: Vimeo https://vimeo.com/140206288

This piece of writing outlines some of the processes involved with the creation of the sound-score composed to integrate with the film '3 Church Walk', directed by Emily Richardson, focusing on the performative location as a resource for sound materials in the creative process. The physical location is both the subject of the film and the sounding instrument performed in the music score. The musical work is concerned with sounds that can be found by interacting with the building, as a result of human contact. As the composer and performer on the building, I attempted to capture sounds that would give some sense of the relationship between the previous occupants and their habitation. In a

process of testing and discovery, the score was made using the sound as a form of knowledge drawing on the possible ways of listening to and having contact with the surfaces, volumes, and surroundings. The work is used to reflect on ideas concerned with the locating of performance, and provides access to different modes of performance practice. As the performer, I am creating a score that uses the building as an instrument, and then creating another performance that can be accessed by my studio construction of the sound for the film. The first is a performance made in isolation, as a kind of dialogue with the sound materials of the building, and captured as recorded documents. The second performance is a dialogue with the documentation, that is made to work in conjunction with the filmed materials. A third location is that of the projection or viewing, and a context with its own characteristics and mode of operation. Each of these performance modes connects to dimensions under the headings *practice, technology* and *community*, as used as a methodology in this research, and they provide critical perspectives accessible within my practical work.

The house at 3 Church Walk was designed and lived in by the architect H.T. Cadbury-Brown and his wife Betty Dale. Constructed in 1962 on a site in Aldeburgh, Suffolk, that Benjamin Britten had intended to build an opera venue, as part of the Aldeburgh Festival. The building reflects the intentions of the 'Brutalist' style and the influence of Bauhaus Modernism. The film reveals the house as it was left in an abandoned state due to legal issues after the architect’s death in 2009 when the house was sealed shut and suffered damage and decay due to the damp and cold. The images in the film capture the moment it was released from this state. The film's director, Emily Richardson has made a number of works that deal with the concepts around place and time, previously working with sound artists, Chris Watson and Ben Drew. When I was approached to offer some ideas about the sound for this film, my ideas were to focus on how to reinforce the familiar detail, materials and spaces of the building, as they might have sounded to the inhabitants. There was a focus on what the building had to offer up without the intrusion of a pre-planned score. This was conceived against a background of near-silence, natural environmental detail and subtle listening. An important feature in the research was to allow the surfaces and materials of the building to provide a basis for the timing, rhythm and pitched material. Much of the musical structure is provided by very simple interactions with the contours, frames and constructions within the house.

The film starts with long, still shots of the house from the garden, rich in the natural detail of a mature habitat. There are pine trees and bushes moving in the breeze and fragile movements of nature against the contrasting structure of glass and concrete. There is movement and lightness, the glass reflections fixed behind the shaking leaves. The size of the garden means that there are no boundaries, just trees and large plants framing the image in every direction. There is a balance to the composition of this space; it is composed, designed, thought about. The camera is always focused towards the house, getting nearer in each shot until the view is directed inside the windows and able to pick out items carefully made for the inhabitants. The glass creates a myriad of complex reflections that sometimes obscure the spaces beyond.

The description of the visual journey to the house given so far has not engaged with sound though the elements in this space seem familiar; we almost fill in the gaps whilst reading it. Watching the film of this section in silence is quite different. The scene is literally muted, it is not complete and there are questions to be answered. A lack of sound information means that we are offered a visual version of the context without an unknown but important sense of its complete identity. The blocking out of the sonic part of the context leaves the viewer asking questions about their presence in this scenario. The camera is guiding the viewer to a version of the visual space without the sounds of the objects moving in it, of the possibility of human activity. It is a house, and therefore it has a relationship to its occupants, at the time of the film being made or previously. There is space of emptiness to be filled, which has the potential for an imagined sound commentary and sound aesthetic. Sounds can be sculpted into any number of relationships, to the image and with themselves. The soundscape that actually accompanies the film is completely constructed from collected found materials. All of these sounds had to be sourced at the exact location of the house; the sounds of the pine trees, rhododendron bushes, grasses, distant human activity, garden birds, seagulls. Recordings of these elements from further afield did not work, the fine detail of the moving images had to match the sound movement, subtle characteristics and scoring. This attention to detail, to listening, was necessary to prepare and lead into the contrast of the inside of the building, where the surfaces of human existence are balanced finely, away from nature.

Inside the house, the rooms are sparsely filled, the view is always partly filled with glass in windows and mirrors. There is light entering from many points, including the

skylights. The floors have loose warped cork or ceramic tiles that produce a range of sounds even from just walking. There is the distant hum of a fridge and heating, the wind is heard as a muted hiss through the damaged window frames. Each room resonates with a different set of frequencies and has different reverberation characteristics, which were analysed and utilised as part of the score, treated as equal to any of the more obvious sound-sources, like the angle-poise lamps. Each room was sonically investigated and tested for sound-materials that could only belong to those spaces. By drawing a small stick across the glass it was possible to bring out the pitches of the different windows. Moving a coal shovel along the fireplace or tiled floor produced a range of sounds characterised by different abrasion or friction, producing smooth or rough grain qualities. Doors, empty shelving and cupboards resonated when moved or touched lightly. The walls resonated and metal furniture produced subtle glissandi. When listening and recording against the background of low level noise, the house offered a vast spectrum of contrasting sounds. The process of discovering and observing these was a solitary performance, captured by the recording technology, a moment of creative work that would have been impossible with an audience present. The recordings were not used to capture single sounds but to document moments of interaction with the building. The duration of the recordings extended to catching continuous, repetitive and evolving sounds, in a process that captured ‘sound scenes’, in a similar way to a film shot of a space. The intention was to perform the house as an instrument to be discovered. To perform on it in a way that was empathetic with the mode of living in it. Richard Coyne suggests that, ‘tuning applies to space, being in the same place at the same time.’ (Coyne, 2010, p.85). In this situation, the performer is in the place that other people have occupied and attuned to, so part of the challenge is to be receptive to the sound phenomena that exists and would have existed before. The sounds reveal the intimate relationship between the immediate environment and the people who had regular contact with it. In his large conceptual works, visual artist Gaetano Pesce, refers to space being imprinted on a human scale, and sculpture-installation artist Loris Cecchini utilises the extension of space in his work as 'the refuge of the individual and the family in movement' (Maraniello, 2004). Following the arguments of Miwon Kwon, writing in ‘One Place After Another’ (Kwon, 2002), that outline the transformation of site-specific materials as they become de-contextualized, it is possible to return to the 'here and now' experience where the aesthetic signified experience is related to its signifier. The actions of making the sounds mirroring the tactile familiarity between the house and its inhabitants.

In the process of making the sound score in a studio, the documented sound, or ‘sound scenes’, were subject to critical listening in an attempt to focus the detail of the materials. The reverberant qualities of the rooms had been documented, enabling the acoustic properties of the spaces to be used as compositional elements. The intention for the sound-score was to develop an intensity of listening and awareness to a sound world that would have filled the building when it was lived in.

6.4 Audience

In a post- preview discussion of the film, an audience member described how when watching the film, they had been looking for the source of the sounds in the images, drawn between both, into the interior world of the film. There is no literal correlation between the images and the sounds, both have their own constructed internal relationships. The sounded objects are not performed on in the conventional musical sense. This is not an instance like John Cage's 'Living Room Music' where household items are arranged and used like conventional musical instruments incorporating rhythm patterns and pitched lines. The object's inherent sound qualities are carefully investigated and brought to the surface. The art of finding these and responding to them is a performance objectified by the recording process; structure of sound-objects that follow a logic common to the movement, observations and other experiences of the long-term occupants. A similar model for the structure would be as if the sounds were words in an abstract poem, filling spaces in a sentence in which the meanings are continually shifting. The sound-objects are possibly perceived through the self-referential 'reduced listening', referred to by the film-maker/composer, Michel Chion, and citing Pierre Schaeffer (Schaeffer, 2017, p.211), where the listening focuses on the sound itself the object, although there are times when there could be a semantic interpretation, the movement in sound reflecting the dynamic of the human existence (Coyne,2010). 'Poème Électronique' by Edgar Varèse, for the space of the Philips Pavilion at the Brussels Expo in 1958, uses many recorded found sounds, juxtaposed to form relationships across its time structure which also traverse the physical space in its diffusion across a performance space. The title declares it a poem, an arrangement of sound-words.

Eventually the process of producing a completed film that is presented to an audience fixes the image and sound relationship. There are many phases of performance present or documented in this near-final stage. The house is the focus of the first performance, which might have started with the intentions for its construction. Cadbury-Brown interpreted architecture as a form of dance, fixing structure in the midst of moving life-forms. The openness of the exterior of the house allows the movement of light and nature to enter into spaces that are made for human activity. The humans living in the midst of a natural world. My interaction with the building produced another performance that is recorded, suspended until the film is projected to an audience. The recording equipment is the only witness to this event, as the performer, I am the audience to my own activity, observing my own efforts. The composite qualities of the sound environment within the house also continue a sense of when it was occupied, so a story unfolds. A space that embodies its purpose in the remaining acoustic properties just as much as the Oracle Chamber, Hypogeum, Hal Salfieni, Malta used by Jennifer Berezan in 'ReTurning' (2000).

The projection of the film does not fix the performance dynamics of the work, as it is shown in different theatres and space with different technologies, when both the image and sound are projected and perceived differently. The site where the film is projected offers its own understanding of the sounds, as they disperse around the projection space. The projection instance is another form of performance as the sound-score occupies the new reflections and resonances of the space. The properties of the space will emphasize different characteristics of the sound, with smooth, hard surfaces creating the potential for higher frequency reflections, and an emphasis of the reverberant spaces in the film-score. A space with softer, absorbent surfaces, or strong resonances, might emphasize the lower frequencies, and in the case of this particular sound-score pick out the motor-sound of the refrigerator, or rumble of the external wind.

A review of the location for the projected performance, and the characteristics present in the sound-score, is in the domain of the audience. The creative work in my practice for this film, was to find a way of engaging the audience in the detail of the sounds available in the building, in order to witness a dialogue between it and its inhabitants. This idea extends to the possibility of the sound-score 'including' the audience and giving them

a sense of actually being in the same space. Later, in Chapter 7, there is further writing about the possibilities for the sound to be experienced beyond the frame of the projection screen, to make the entire projection space a three dimensional soundscape similar to that of the interior of the filmed building. In attempting to engage an audience into the intimate world of the house, they are being invited to join a community that includes the performer's actions in the house. They are participating in an event by their inclusion and access to the detail of the interior.

7 Technology

Introduction

The subject of technology has appeared in earlier case studies, where it was shown to have an impact on the resources available to a performing musician, such as new musical instruments, performance software, and the nature of the score-text. This chapter is focused on works that are dependent on new technologies, purposed for a location beyond the localized performance space, and are created for web-located performance. The practice takes place in an environment that depends on the use of technologies to achieve its realisation, in terms of its creative activities, communication and access. The research is concerned with engagement and performance activity located through the development of technology enabled networks. In this chapter, *technology* refers to the software, hardware and materials to create musical works that contribute to an evolved sense of place, site, or location.

My role as a performing artist has expanded to incorporate an understanding of how these technologies develop and operate. For my practice, it is contingent to work with what is available and understand new developments, including new technologies, as an extension of my skills and knowledge. The research is driven by works that are located within a technologically-enabled environment. The works are created for that environment. The works are accessible as remotely located broadcasts or streams for observation, response, and interaction. The intention was to research alternatives to the convention of an audience passively receiving a broadcast of a performance, and understand how this model can be disrupted with the integration of new technologies. The relationship between performer and audience has altered as a result of evolving communicative structures and in Chapter 7, the focus is on how new technological developments have enabled creators and audience to establish different identities and communities.

7.1 Case-study 1

Four audio/visual materials from works under the title, ‘Abstract X’

Title	link to web address	QR Code
Abstract 28X	https://youtu.be/5fGlPKfUKqI	
Abstract 29X	https://youtu.be/v5NnXdMpjBA	
Abstract 30X	https://youtu.be/KImhF979Wlo	
Abstract 31X	https://youtu.be/gOK8ouSxUEI	

As the recordings are large files of audio/visual materials, they are located at website addresses on the Internet. The links are set out as Brower links and QR codes, read with an ‘app’ on most ‘smart’- phones, usually built into the camera application. The QR code link method can be very fast to upload, within wifi coverage. The immediacy of access and the quality of the materials, made possible by the Link/QR Code, are characteristics of the new technologies, and contribute to an evolved relationship between the performer and audience. Accessing these works using this method provides some insight into the potential for active engagement by the audience and informs the discourse later in this chapter.

The works are dealt with collectively as case studies because they are located and accessed via the internet, in an environment that facilitates them to function as performative art works. The works are located away from the more conventional contexts, such as concert halls or theatres, and interrogated for ideas concerned with technologically-enabled musical performance. Ideas such as, the variations in spatial and temporal conditions, broadcast and reception of the performance, variations that affect frequency and latency responsiveness, and clarity of the sonic image. The writing draws

on the study of film-making, musical technology, cyber-networks, multimedia, and social structures around a technology-enabled performance practice, and have been considered for their usefulness in addressing the multi-layered and multi-faceted nature of the technologically-facilitated performance site.

7.1.1 Production Characteristics

The 'Abstract X' works have common production characteristics, such as the use of live capture of the location sound, the editing and recording technologies, the close proximity of the camera work, the intimacy of microphones. They are made with an intention to invite the observer to engage with the detail and intimacy of performative action. The musical instruments appear close to the surface of the screen and close to the viewer, as if it were possible to reach out and touch it, as proximal and tactile objects. The performance details are located at a place on the network as digitised data, with its associated Internet access address. The data that has captured the intimate sound and close-up images, connects performer and audience cross boundaries and nodes of different communication technologies.

The materials, as remotely placed performative and responsive musical materials, are addressed as part of a critical process embedded within the practice. The investigation starts with the process of accessing the materials, attempting to identify how the materials operate within the location where they are uploaded or stored. Operations that affect the functioning of network components, such as variations in communication speed, data rate and bandwidth, and ease of access, have moved to the users control, dependent on network access and contractual possibilities. The resolution of sound and visual materials, proportion of image frame size, operations such as 'play/stop' buttons, speed of playback, and more, have become elements of the user-interface. The networked site is enhanced with functions that allow the viewer to intervene, interrupt or adjust the performance, giving the viewer a degree of control over the event. The viewer decides how and where they engage with the performance, as part of a context that defines how it is accessed, through social media, websites and providers of content. The integration of viewer choices and access to modes of broadcast redefines the relationship between the viewer and the creative practice.

7.1.2 Extended Cinematic Sound-spaces

The production process of making the audio visual materials, took into account the fact that they would be placed on remotely located platforms and viewed with a computer or located projection screens in a gallery space or similar. The works could be viewed in a space occupied by the audience, whether that's a video or mobile phone screen for an individual, or a large number of panels in a large gallery type space. The work can be understood as performative in that it has qualities that take over the space, by the use of light and sound. 'Drum Roll' (1998)[44], by the director Steve McQueen, is a work that seems to perform in the projection space. It shows a large oil barrel being pushed through the streets of New York, with close-up camera work and sound recording. The proximity of the drum to the camera, and the way it fills the screen, gives the impression that it could roll out of the screen into the projection space. The sound fills the space as if it is coming from an oil drum in the room. The conventional format for film usually includes the soundtrack, but here I am making a distinction, referring to films where the sound is emphasised in the balance with the image. A situation where the film is projected in a gallery space, possibly using different configurations of multiple screens and comprehensive sound diffusion systems.

Artists such as Christian Marclay [45], Katerina Pejoska[46], and Bill Viola [47] focus on the proximity of the visual/sound objects in some of their works. They seem to extend into the projection space as a result of the sound resonating and engaging with the spatial acoustic properties. 'Talking Drum' (1979) and 'Hornpipes' (1979) are two works made by Bill Viola that exist as sound works, focused on the resonating qualities of spaces. The works illustrate a focus on the importance of the sound, for an artist known for his extensive visual output. Sound is present in the work as material to be manipulated beyond providing a soundtrack or Foley sound for moving images. The sound resonates in the projection space. The visual element is dependent on configurations of flat, two dimensional projection surfaces, giving the illusion of depth of field when viewed from specific locations. The sound element extends a sense of the work beyond the projection

[44] 'Drum Roll' (1998). Winner of Turner Prize in 1999 https://www.sfmoma.org/artwork/98.192.A-C

[45] Guitar Drag - Christian Marclay (1999) video
https://www.youtube.com/watch?v=ENzw0XGAX2Q

[46] Choir Film, ICON GALLERY, 2009

[47] Bill Viola, https://www.billviola.com

surface into the three dimensional space surrounding the screen. It is immersive and emerges from the work, providing its own sonic space.

In the 'Abstract X' works, the sound is understood to have this function of reaching out, of sounding in the physical space around the projection. This idea of extending the sound space is true, even if it takes place on a sound diffusion system that is remotely located at the viewer's destination. Post-production technologies were utilized in order to emphasise resonant frequencies, enhance the spectral range, and disperse sounds across the sound space. The intention was to bring the movement, and sounding materials to the attention of the viewer. The technologies were understood in the planning and instrumental phases and then incorporated into the process, after the recording of the audio and visual materials. As the performer and creator of these works, my actions were governed by my knowledge of the technologies at the pre- and post- stages of the production. That a performer's practice can engage with such a range of technologies, leading the production process from the initial conception to the space occupied by the audience, indicates that there is an evolved set of performer practices. In a conventional concert performance, the performer is responsible for the sounds and actions that take place directly with a physically present audience. In the new technologically-enabled space, the performer has the same responsibility, but has to maintain it across a terrain created by new software, interfaces and networks. A terrain that is constantly evolving.

7.1.3 Technology and Sounding-Objects

Details of the sounding objects in the 'Abstract X' pieces are used to understand how the instruments, such as the metal 'Flower-Bells', discs and springs, were introduced partly a result of observing the work of other artists and their relationship to different technologies. Whilst studying as a percussionist, I was drawn to working with art students at the Royal College of Art. This work engaged with technologies found in the department for Mixed-Media, later known as Environmental Media. This connection allowed me to work with students in projects that used materials, such as metals, plastic, found objects, and amplification, to make sounding objects, in different configurations of the performance space. The work integrated technologies used to manipulate and extend the performance possibilities of the materials, using electronics to resonate, amplify, and diffuse sound. I had access to information and events by artists working in spaces such as

the Serpentine Gallery, Acme Gallery, the ICA, and Butlers Wharf. Some of the ideas behind the materials and methods used in the 'Abstract' works relates to the earlier period of experimentation with the technologies, spaces and instruments. The 'Flower-Bells' and discs are made using computer controlled water-cutting processes, directed by my CAD[48] drawings, using contemporary technologies to achieve a development of ideas from the earlier practices. There is a relationship between those early experiments and the visual/aural qualities of the 'Abstract X' sequence, and with my experiences of the practices of artists such as Stephen Cripps, Paul Burwell, David Toop and Max Eastley. As a percussionist, I was partly drawn to these artists because they integrated percussion sounds and techniques into their work.

Stephen Cripps used film projection as part of mixed-media performance in 'Halo' [49], that also included sounding objects, percussion instruments and welding-torches. The projections were used as performative components, both extending the visual dimension and being manipulated in the performance. The sounds and actions outside the film, in the physical space, could be seen as an extension of the actions on the two dimensional screen. The work has been described in 'Performance Machines' (Museum Tinguely, 2017) as 'Extended Cinema', as Cripps often referred to experimental cinematic practices that worked with new projection formats. The extent of the non-filmic content seems to have been greater than that of the projected image. Many of Cripps' works were loud, noisy and explosive and the senses would have been bombarded by the sounds. Also, in 'Halo', the projection screen was eventually set on fire as part of the work. I have referenced my own use of mixed-media performance technologies, and some of these used combinations of physically present sounding objects and film projection in configurations similar to these works by Cripps.

7.1.4 Proximity to Sounding-Objects

The images are often of close-up detail that exclude the performer. The proximity of the camera and microphones, limits the view and sound to the performed objects. The sound qualities are intimately related to the sounding objects, the only sense of a location is that of the immediate object, not of the larger space occupied by them. All sound is

[48] Computer Aided Drawing software, CAD

[49] Halo, Acme Gallery, 1977

made with close positioning of microphones and a direct audio feed from a computer that is processing the sound, using patches created in the Max4Live software environment. Sonic spatial information is added later. Filmed and recorded materials have been worked on in a post-production studio. The times and durations of the entire works are consistent with the original 'live' recorded materials.

The titles indicate that they come from an numbered series of 'Abstracts', that exists as texts, musical scores, images, or studio based works. The term 'abstract' is used freely, denoting a number of different senses of that word from one work to the next, playing with its possible meanings. They could be potential reductions of larger ideas, stripped down ideas that can generate further material, or inconclusive sketches. Many of the works start as brief sketches, with markings on paper.

These recorded audio/visual materials are grouped together because they are characterised by shared aesthetic production factors. As some of the production values are consistent across the four 'Abstracts', there is a sense in which these works are part of a larger piece of work. They share musical and production ideas, and ideas 'bleed' across the visual/audio canvas, borrowing from each other. A list of characteristics includes the following: the visual and aural proximity to the sounding object concentrated on viewing the sounding materials (Abstract 28X, 0' 17") ; the lack of any clear view of the human performer (Abstract 28X, 1'47") ; restricted to black and white images; the 'grained' quality of the image; post-production in a sound studio; a dynamic relationship with the vibrating surfaces (Abstract 28x, 0'19"); a shared set of sound production values including the computer programming and software used to make the sounds; the integration of short musical events into a broader electronic canvas; a focus on the physical act of playing an instrument (Abstract 28X, 1'04"). There is a close observation of the disturbance of the materials producing the sound, associating the visual image with the vibration, resonance and contact.

7.1.5 Process of Assembly

Making the materials accessible on the website is not a linear process; the materials have been moved in and out of different modes of writing, recording, editing and post-production. Each of these modes operates at a different rate in different

production environments. The construction into a file that can be played from start to finish does not mean that the temporal and spatial elements are fixed. The viewer has control over the processes of broadcasting. The nature of this construction, with its varied components is similar to that of film production. The film production process is the subject of writing by Walter Benjamin which offers a perspective on the nature of the assembly and relationship between different operations. It describes aspects of the process in a way that I can apply to my own practice.

> *.....the director may resort to arranging, one day when the actor happens back to the studio, for a gun to be fired behind him without warning. The shock registered by the actor at that moment may be captured and later edited into the film. (Benjamin 1936, p20).*

At the centre of this quotation is the imagined sound of a gun being fired. The subterfuge and lack of warning by the director, plus the shock of the actor, gives a direction and energy to the description, like the sound of this shot. It is also possible to get a sense of how different contributors to this scenario, each have a different knowledge of it and everyone but the actor is thinking about the audience's reaction. The imagined sound and image, seems to move from the studio, through its place somewhere in a sequence of moving images, into the space of the audience.

The description helps us to understand how the process of making a film is one of construction and montage. The set-up by the director enables the camera to capture a single action that will join the images before and after it, to create the required dramatic effect. Though Benjamin's writing concerns an actor's relationship with the mechanical processes of making a film, its focus on key stages of the transfer of creative materials could be applied in understanding the processes of technologically-enabled musical performance. His writing describes a process that is both linear and multi-lateral, and different to the linear flow of action on a theatre stage.

The production of the work is "broken down into a series of episodes that can be assembled" (Benjamin, 2008, p.20). The process moves from the initial idea to its completion, through an integration of actions that have their own spatial and temporal functionality. A procedure of overview and direction results in these actions being

constructed into an entity to be broadcast. The nature of this structuring provides a perspective for understanding the performance that incorporates multiple technologies. It offers a framework for articulating ideas that inform a technologically-enabled performance site.

The brief film clip forms part of a bigger entity, the complete film, which then becomes part of the context in which it is viewed, and part of a larger schema of different contexts and audiences. The audience is a part of the networked structure that also includes the performer, and brings ideas about the identity of the audience into this investigation into the performance locus. The topic of trans-media and multimedia connectivity is further investigated, in its relation to the recognition of the audience and the identity of the community established by the performance activity. Ideas concerned with *Community* are the focus of Chapter 7.

The sound of the gunshot, the image of the shocked actor and our reactions, are sited within the larger schema of the entire film, beyond Benjamin's written description. As Deleuze has written, "All framing determines an out-of-field, a larger set, or another set with which the first forms a larger one, and which can in turn be seen, on condition that it gives rise to a new out-of-field" (Deleuze, 2009, p.16). Deleuze's idea helps to place the technological structures within a field of aesthetic practice, bounded by the engagement between the production and its reception. It provides a perspective for viewing a performance site occupied by performer and audience that is mediated by the larger field of multiple technologies.

7.2 The travel across media

There is an order to the actions in Benjamin's text that illustrates how other processes can flow into a main purpose. This idea can be applied to the production of the case-studies, 'Abstract 28X - Abstract 31X' . There is a sense of how the journey moves outside the linear sequence, into adjacent yet synchronised fields of activity, and into larger sequences that will make up the entire film. A script lays out the film's structure, a result of input from contributors with other skills; such as, choreographer, lighting designer, screen-playwright, photographic director. The ideas for the film are communicated between specialists dealing with the workings of the movie camera, set

design, location, lighting, director of action, actors, and more. Then there are the technical processes of developing the images, compiling, editing, dubbing sound, and more (Reisz & Millar, 2010. p.15). For my pieces, 'AbstractsX', making the materials accessible on the website was not a linear process; the materials have been moved in and out of different modes of recording, editing and post-production.

Writing in the nineteen thirties, Benjamin states, 'no other revolutionary service can be ascribed to present-day film in general than that of furthering a revolutionary critique of traditional notions of art.'(ibid., p.21). Moving forward to the twenty-first century, this 'revolutionary service' could be put to service as a methodology for tackling the new mechanics of cyber-technology and networked performance. Instead of addressing 'traditional notions of art' of that epoque, it could be applied to creative practices that are bounded by the rapidly evolving socio-technological structures of the present time. The technological processes of film-making overlap with many contemporary developments and could provide a 'critique' of the evolving nature of its operations. It is possible to separate out 'traditional' ideas, in order to understand other paradigm shifts in the performance locus. One established technological process can be used to critique the activities of a newer technological environment. Although this description was written in the early part of the twentieth century, it opens the way to a critique of the processes of mediated performance in the twenty-first century. Benjamin's approach might be applied to operations in the contemporary field of interconnected media. It might provide a methodology for addressing the relationships between the different levels and sites of activity, in a multimedia that are constituted by cyber and digital technologies, performance texts, physical location, and participant engagement.

The final manifestation of the moving images is proposed in the writing. Bridging the different temporally and spatially located activities is the performative quality of the event. A performative moment; something being done that is experienced. It affects the observer as 'something passing from one to the other' (Deleuze and Guattari, 1991, p173). This is a performative moment dependent on the idea of the action; we actually don't see or hear any of it. The 'surprise shot' is described technically but comes into existence through its communication across the media of writing about the practicalities of film editing. The writing is a media component in the journey of the idea. Benjamin's concerns about how 'the very nature of art had undergone a change' (ibid.p.15), due to the take-up

of new ways of seeing with new technologies, could be applied to the nature of performance.

7.2.1 Crossing media boundaries

The contact between the performer and the audience is partly enabled by the availability and quality of the sensory data, it determines the nature of their sensory engagement. Reviewing the travel of this data across the different points of transfer, with a focus on the qualities that affect it, provides some insight into the nature of the performer/audience engagement. The extent to which the qualities of this data can confirm or reinforce this performative encounter, can be matched with their capacity to establish an internalised physical mapping, embodiment, or engagement in the observer. The connection between event and observer forms the basis of an encounter characterised by bodily engagement, according to Andy Lavender (Lavender, 2016,p.97). He writes that, 'artistic production lands in sensation in the present. That which is seen (read, watched) is also by definition experienced' (Lavender, 2016, p.99). The sensory data is constitutive of the 'something passing from one to the other' (Deleuze and Guattari, 1991 ,p173). The quality of the transferred data materials contributes to a purpose that is practical, enabling the observer to participate in the event.

7.2.2 Crossing network boundaries

The cyber-network and its nodes of connection can be understood as constitutive factors in a performative event. Any shift in the way these elements operate separately and as an interconnected system, will have an impact on the relationship between the performer and audience. If the modes of connectivity change, then the conditions for the performative event changes. This chapter makes the case for an evolving locus for performative action that is sited across a terrain of different media. In order to sustain an encounter between the participants in actions that establish the performative locus, the nature of the connectivity and its adjustments are conditioning factors.

Benjamin's text maps out a technical and aesthetic terrain. The term 'terrain' is used in a similar way to its use by Nicholas Cook in *Analyzing Multimedia*, when he writes 'different media are seen as occupying the same terrain', in his proposals for

contextualised modes that address multimedia (Cook, 1998). This writing by Cook helps to understand how different structures within multimedia can be categorised as different models of operation that each have their functional and productive characteristics. This chapter draws on Cook's concept of 'modelling' alongside concepts from Benjamin and others.

At this point, the term 'terrain' is taken and used throughout the writing, to define a space occupied by the placing of technological objects. The components, configurations, and operations that make up the terrain can be considered for their part in establishing a site for performative action. The case-studies attempt to demonstrate how the site for music performance traverses this terrain, bringing it into existence by performative action. Understanding how ideas and relationships operate across that terrain can help articulate ideas in the remotely-sited practice in the works at the centre of the writing in this chapter.

The 'multi-media terrain' (Cook, 1998) is in the most part addressed here as a form of cyber-network, structured around technological components used for communications, interfacing and musical instruments. Its meaning is also extended to cover other types of materials outside these component objects. These materials can exist as musical texts, audio and visual data, and otherwise manifested within communicative or transferable media. Ideas that can be inserted into a network are also considered part of this terrain. It is useful to isolate some of the various components in the terrain and observe their operations.

The audio/visual materials are at different locations to the reader (audience), and their transfer can be investigated to understand aspects of resilience and coherence . This reflects another model of multimedia, that of 'coherence,' as opposed to 'consistent', as proposed by Cook in his application of the 'Similarity Test' to different iterations, or instances of multimedia (ibid.p.100).

The order of some of these components can be changed, according to a model of 'conformance' suggested by Cook (ibid, p105). For instance the film could be constructed around the continuity of the music, or passed to a composer in its final edited form. In the 'Abstract X' series of works, the film conforms to the unbroken sound recording. A change in the conformance would impact the nature of the work across the network, consequently affecting the viewer engagement and sense of performance. Cook provides a model that

puts the temporal integrity of the work as the consistent element across the different technologies of the network. If the unbroken timeline of the work is the primary requirement, then the variations of other elements, resulting from the transference across different technologies, can be observed.

At the time of Benjamin's writing, new technologies had the effect of distancing the actor from the audience, he writes, 'the apparatus that mediates the performance.. is not obliged to respect that of the performance as an entity' (Benjamin, 1936, p17). He writes of the 'cultic' (Benjamin, 2008, p.14) value of film and how the film camera lens can be understood as a scientific tool of observation that 'tests' its subject (ibid. p.14). As the human image becomes diminished by the detail in which it is placed, the cultic value is pushed away in exchange for the value of display; free-floating contemplation is no longer an appropriate reaction (ibid. p.15).

The different technological processes contribute their own filter to the materials, as interpretative operators with their own critical criteria. The camera is operated according to aesthetic and technical criteria consistent with its own values and judgements. The audience can only view the images captured by the lens that is directed by the gaze of the camera-person. Benjamin writes of the camera making a 'series of optical tests' (ibid.p.18), and the audience empathising 'with the performer only by empathising with the camera. It thus assumes the camera's stance: it tests' (ibid. p.18). The actor can only perform for the camera, a long way from the interaction with an audience facing the action on a stage. For the performing musician, the microphone operates in a similar way to the camera, as a tool that can be focussed on the sonic output of the performance activity.

7.2.3 The 'Testing' Microphone

The microphone can brought into proximity to the sound, or made to receive sonic information from a wider field in the physical environment surrounding the performer acting on sound-making objects. From the performer's viewpoint, it is a technical object that is inanimate, at the control of the sound engineer. The performer has to imagine, based on their experience of the recording process, how the qualities of the sound at the point of performance are conveyed through the microphone to the next stage in the sound

processing. The microphone can also be understood to be 'testing' the object it hears, that it brings its own technical focus and aesthetic practices to the process; it is a component functioning in the journey across the media terrain. In the 'Abstract X' works the microphone is a technology that has become part of the instrumentation, in that it is manipulated by the performer, in order to achieve a different relationship between the listener and the sound object. With the use of 'contact' microphones, placed directly on the objects, the performer is selecting which characteristics are being made accessible, guiding the listener towards the sound qualities and the instrument they belong to. The process of including the listener in this direct relationship to the sound is similar to that of placing the viewer into a visual image with the use of perspective. In the discipline of visual imagery, a technique developed by Alberti in 1435, of placing marks on lines that mathematically draw the viewer's eye to the point of infinity, gives the viewer a sense of being part of the scene. There is a tension between the viewer's position and the space defined by the use of a visual perspective. The viewer is a subject in the scene they are looking at. With the use of an integrated microphone, it is possible to position the listener next to the sound-object. By allowing the listener this proximity, they are included in the same environment as the performer. To rephrase Foucault, writing about the viewer of the painting, 'Las Meninas' (1656) in *The Order of Things* (1966, p5), it is the listener who completes the scene. The technology in the sound-making environment provides materials and qualities that contribute to a shift in the relationship between the performer and the audience, wherever that relationship occurs. The occurrence could be in any space in which the materials become accessible by the listener. This chapter goes on to investigate how that relationship, brought about by a performance encounter, can be displaced temporally and spatially across different technologies.

For the 'Abstracts X', the performance was made 'to' the camera/sound recording in an attempt to have some control over the images/audio at later stages in the production process. This is different to the idea of 'for' the camera, in that the recording is not documentation of a complete performance within its performance context. The physical environment has been restricted in its presence, both visually and sonically, in order to be able to manipulate the sound environment and work with the qualities of the objects within it. In the 'Abstract' works, control of the sound environment is considered an element of the creative work.

The terms ‘internal space’ have been proposed by Michel Chion (Chion, 1988) and ‘composed space’, ‘listening space’ or ‘superimposed space’ by Denis Smalley (1991), to find ways of categorising this sound environment of the production process. In the case-studies: ‘Abstract 28X’ to ‘Abstract 31X’, the post-production work is part of the creative practice, with reworkings of recorded visual/audio objects and a continuation of a process of analysis and reconstruction against a consistent time-line. The one aspect that has not been altered is the continuity of the time in the recording. The production is set against this unchanged time-line throughout the materials accessible on the website. The initial audio sequence is unbroken and this can be thought of as a mixture of the ‘coherent’ and ‘contest’ models of multimedia (Cook, 1998, p.105).

The potential for engagement, as a part of music performance and structured by thought and physical interactions, possibly even embodied thinking, has a capacity beyond the linear travel of information from one part of the journey to the next. Henri Bergson has proposed that “thought moves in two directions at once: while it unfolds along a horizontal axis, it also expands across a vertical axis. The former is an axis of association; it links related images through principles of similarity and contiguity, contrast and opposition.” (Bergson, in Rodowick, 1997, p.10). This concept could be expanded to a view that encompasses a more three dimensional view of the capacity occupied by the engagement in the writer/reader process. The adoption of the idea of a more spherical or three-dimensional space matches both the physical and conceptualised site established by performative action, and has been proposed, with reference to a range of proposed theories (Connor (1997), Nancy (2009) Ingold (2000), Ojala (2009), Harley (1994) et al.). In this critique of the performative locus, the definition is opened out to points that surround the central figure of the performer. The terrain of multimedia activity contributes to a broadening of the scope of the performative locus to encompass the site across networks, as a place for performative action and field of theoretically informed practices.

The control of the sound and visual space in Case Study 1 works is very tightly bound to the articulations, activities and instruments of the performer, with any full view of the performer excluded. In contrast, the works that form Case Study 2 of this chapter use a different approach in their production. Technologies are used to create a different set of production values.

7.3 Case Study 2

Two audio/visual works titled , ‘Rimshot’, ‘Shekere’.

Title	link to web address	QR Code
Rimshot	https://youtu.be/krbiiYC6Tmg	
Shekere	https://youtu.be/fqRtudyCHAc	

At first viewing, it is clear the performer is present throughout most of the visual material and situated in front of the camera. The camera shots are further away, the figure of the performer occupies the frame, and a larger sound space is created. A characteristic of the non-reflective black background is that it offers very little information about the physical location. So the performer and instruments are the only elements being shown to the camera. The use of only black and white tones instead of colour also highlights the focus on the performer. The performer is engaged in the performance of musical activity, controlling the instruments and following some form of musical structuring text. The view for the observer is through the lens, it is not the performer’s view, nor the view of an observer who might be in the same physical space as the performer. The performer sees only the lens and its operator, moving about the space in relation to the performer and with their own view and productive text. The audio element of the performance is also presented to microphones that capture it, and their focus is adjusted according to a system of choices governed by a separate text.

Benjamin writes of the performer being ‘exiled’ from the audience; from the perspective of the performer, there is no direct contact with the audience (Benjamin, 2008, p.18). The actor has no sense of the audience’s reaction and no feedback to confirm the performance. There is no encounter between them. The ‘testing’ quality of the camera, can lead the audience to other objects and actions that the camera operator or director chooses, as the gaze is directed to elsewhere beyond the framed aesthetic of the

human figure. The audience is not in an encounter with the camera; there is no feedback. The camera is leading the investigation and the audience follow. For the actor, all that remains is to perform to the camera, in accordance with the director's control of the images for the following process of editing. In the works of Case-Study 2, the performer's actions are made with an awareness of the technological processes beyond the camera, with intention and anticipation for the location where the viewer engages with them. Every detail of the action and content of the works is chosen to focus how it might be viewed. The movements of the hands and body, embody a knowledge of place and time, to follow LaBelle's ideas about the hand moving through space. As the performer, I am extending my understanding of the performance-space to a location arrived at by a transference of media across the boundaries of different technologies.

7.3.1 Performer's 'Exile'

Stage performers, such as Buster Keaton and Charlie Chaplin, were drawn to the new media of film, integrating the new technologies into their theatre skills to find a new way of producing their art. The performers who recognised the power of the directed camera lens over the attention of an audience, and experimented with other components of the media, such as editing, managed to progress past the 'exile' that Benjamin observed and established new connections with the audience. Although there is a sense of the audience being led or controlled by the direction in the film, there is also the possibility of the performer establishing a new site for their activity. This new site becomes a place for a range of different performance activities and relationships, as the artist gains more control over the production process. In Case-study 2, there is a play with these relationships and to what extent there is a performance encounter and sense of presence by performer and viewer. The performer is no longer 'exiled' but seeking alternatives to the 'live' staged performance and more recent models of media engagement, such as intervention, responsiveness and interaction.

One of the key elements in the production of the Case-studies is the idea that the performer has an understanding of how the images will appear when they are viewed. They are made to reveal, expose the content, and encourage the viewer into a relationship with aspects within the materials. Control over the proximity of the camera is part of the work in Case-study 1 'Abstracts X'. In these materials, Case-study 2, the distance and

movement of the camera is an important aspect though has a different purpose. The human figure is in the frame, fully engaged in the act of performing. In 'Rimshot' the view is restricted to the central instrument, playing techniques and hands of the performer, without the face. This is done by tightly focussing the light onto the playing area. Secondly, the instruments are featured in close detail and in relation to the human figure. The camera never pulls away to make a view that includes the physical space beyond the immediate location of the performance.

Visually, the information gives a sense of the performative action by the performer and the action on the instrument to make the sounds; two framed actions put against each other, or working together. The two different points of focus are a deliberate part of the work, in an attempt to draw the viewer into the act of performing; almost trying to put the instrument into their hands. The audio component is used in a similar way; the sound is always presented with little acoustic information about the real physical environment. The sound of the instrument is the focus with the use of directional microphone techniques and post-production emphasis of its sonic qualities.

7.3.2 Digital Encounter

Current practices in the domain of film-making have moved closer to those functioning on cyber-networks, as the access to, and distribution of, creative materials that use the moving image as their main materials have become a dominant medium.

In Case-study 1 and Case-study 2, the main component at the centre of the performative practice is an entity that has been recorded and edited using techniques from the production of film. This enquiry is not about the technique of film-making, it is applying ideas taken from that discipline to the multi-valent site of creative technologies. Deleuze gives some support for this approach. In, 'Cinema 2: L'Image temps', Deleuze considers the use of concepts drawn from film theory. He writes, "A theory of cinema is not 'about' cinema, but about the concepts that cinema gives rise to and which are themselves related to other concepts corresponding to other practices, the practice of concepts in general having no privilege over others, any more than one object has over others.' (Deleuze, 1986, p280).

7.3.3 Implications of Digitisation

Kevin McDonald writes about the effects of digitisation on the moving-image: 'By contrast [to analogue] digital images are very different. Digital images have a fundamentally different relationship to the world and, as a result, change the cognitive process by which we perceive such images.' (McDonald, 2016, p.153). He quotes Rodowick's view that while film 'holds us in a present relation to the past and sustains our belief in a past world through the qualities of automatic analogical causation, digital screens require us to acknowledge other through efficient communication and exchange: I think because I exist in a present time of exchange with others, who are not present to me in space' (Rodowick, 2009, p.179). This observation could be applied to the exchange across the cyber-networked terrain or even, the networked site for performance. A listening or musical performance event could likewise be validated by its capacity to 'exchange with others, who are not present in space'. They are present in another form of space that exists across a digital network because of the activity that is taking place.

The encounter that is possible with physical proximity is now possible as a digital exchange, as our bodily actions and gestures are translated into a format for transfer across the network. As Lavender says, ''This is what our body becomes in digital culture, a performing thing of blurring, doublenesses and indeterminacies, all of which are shared' (Lavender, 2016.p.123). The test is whether these shared digitised attributes provide a basis for performative activity. Lavender also states, 'artistic production..lands in sensation in the present. That which is seen (read, watched) is also by definition experienced' (Lavender, 2016. p.99). There is a threshold that has to be passed in order for sensation to be present. The data that travels the network has to be read to become an experience for the receiver.

Stephen Johnson, an influential writer about cyberspace, writes '..the significance of the shift from analogue to digital, a shift that is as much cultural and imaginative as it is technological and economic ...it also promises to transform our experience of the world..' His commentary on the digital 'shift' is later refined when he makes an assessment of the condition of the 'interface', as a 'synthetic' form, 'part of a fake landscape that passes for the real thing' (Johnson, 1997, p.238). 'Fake' because it is a distancing tool that allows the user to operate in a cyber-world without having to understand the language of digital

formatted data. The 'synthesis' allows different types of digital translators, to work 'together in a cohesive whole' (ibid., p.238). The 'cohesive whole' is another way of describing the cyber-network referred to throughout this chapter. The sophistication and real-world modelling of the interface means that users do not experience the 'fragmented consciousness of the digital age' (ibid.p.238).

The synthetic nature of network connectivity also contributes to the sense of a landscape that can be surveilled and travelled across, and for people to engage above a threshold of disruptive digital functioning. This concept of a space bounded by communicative digital machinery aligns with many of the concepts found in the field of multimedia terrain. An Instance of MultiMedia (IMM) (Cook, 1998, p.102), now becomes practical across a digital media that 'functions primarily as a form of communication whereby information is considered valuable only as a unit of exchange within the logic of continuous circulation' (McDonald, 2016, p.154). In this we have an idea that supports the notion of engagement. The value attached to the exchange has a currency for all the participants in the activity, as 'reader/writer' they have something to gain from the exchange. There is also the sense of circulation, something that is necessary for a performative event.

Recalling Benjamin's actor 'exiled' by the camera, there is now a possibility of the exchange functioning continuously, as the performer and audience are fixed into their exchange of information. The 'unit of exchange' enables the performer/audience to be located by the circulation of performance data. The relationships informed by the circulation contribute to the idea of the presence of performer and audience. The idea of *Community*, as advanced by digital exchange, provides a critical focus of performance practice and participation, rather than a review of the technology and media.

Rodowick writes of 'the core concepts of film theory recontextualised in ways that extend and render more complex their critical powers'(Rodowick, 2009, p.188). A recontextualisation of the concepts in film theory within the field of digital networks, can be arrived at through a shift in how they are applied in that field. There are alignments across the modes of operation, and the concepts that come out of them, such as the immediacy and proximity possible with increased communications speed, resolution rate, and reduced latency, for the 'unit of exchange'. The shift in the circulation potential means

that the dynamics of the performer/writer and audience/reader duality aligns with similar developments across other types of cultural information. Performance events are viewed in the context of other modes of activity in the cyber-technological terrain: online gaming, streaming of audio and visual materials, the viewing of 'live' entertainment, opera and theatre performances, online teaching and learning platforms, fashion and other modes of cultural sharing and interchange.

Rodowick proposes that concepts from film theory have a new role in regard to the 'spread of digital culture, as it has become so deeply ingrained, that it is not possible to think without images' (Rodowick, 2009, p.188). The context for the visual shift is also the site for the communicative exchange, and by extension, performative action. Not all performance events are networked, but the language and protocols of the digitally enabled terrain have contributed to a recontextualisation of performance concepts. In the Chapter 6 there is discussion of the impact of evolved approaches to performances created for a site where the performer and audience are in the same physical location at the same time, where temporal and spatial parameters align to the extent that the participants are in some relational proximity in a physical space. Following Rodowick's recontextualisation of film theory, the materials presented in this chapter can be understood in terms of their capacities to articulate a digitally-enabled encounter between performer and audience.

By isolating conventions and practices, it might then be possible to observe ideas that are a state of flux or shift . By highlighting the temporal and spatial shifts across the process of making a film, the description allows the observer to survey these locations as part of a larger entirety that is held together by the tension between the different components. Deleuze references Bergson, when he writes 'The Whole creates itself through time', and is using this idea to identify the shorter film 'shot' within the 'whole' of the film; which is then part of the 'whole' of film culture, as part of a hierarchy of time (Rodowick, 1997, p.148-149). By adopting the framing provided by the traditional model of film-making there is potential for viewing the changes taking place in the field of practice around it, changes that contribute to the practice of performance within the larger field of cultural action.

The performative qualities of the gun-shot scenario have indicated a methodology for interrogating a twenty-first century performance event. Film-making incorporates a multitude of different processes along and around its operations, from the shooting script to the presentation on a screen. This intricate interfacing of many technological elements, each functioning within their own domain, has some similarities to the functioning of cyber-networked production; such as the spatial and temporal aspects; the conversion and transference of the images and sounds; the capacity for editing and 'testing' of the materials at points along its travel. The 'revolutionary service' of film-making becomes a critique that could be applied to the operations of dispersed technical locations, whether they are connected, disrupted or 'dissensual' (Rancière, 2009, p.32)

The materials in Case-study 2, ' Rimshot' and 'Shekere', are structured to produce a performative event that has the potential for an encounter with other participants. The materials are recorded and viewable as film-works but they are not documentaries. They are not there to carry information about a previous concert performance; they are available to contribute to a potential performative encounter. 'Rimshot' starts with the setting up of the performance space, the viewer is being invited into practical, instrumental and very localised spot for the ensuing playing out into the space with the materials. The material is recorded, so therefore of the past in temporal terms, though the invitation is renewed when it starts, the encounter is always in the present. The audio/visual materials carry information about the score of the piece, its duration, rhythms, structure, energy and movement, in the form of a timeline. The images and sounds of the recorded performer convey the work, embodied in the physical actions and intentions of the performer.

7.3.4 Extended into Space

The idea of the body and its movement being a way of articulating this moment of the production of the work, it is useful to call upon the writing of Bergson, when he proposes that the body is the 'centre of the action … situated between the matter which influences it and that on which it has influence', and further that 'having extension into space….my body experiences sensations and executes movements ..becoming...a place of passage of movements' (Bergson, 1929, p.155). The recorded materials are images called up and made active in the present moment of the new performative action, as 'matter

extended into space…as a present which is always beginning again' (ibid., p.156). The materials are constitutive of a beginning that includes the other objects and actions, such as the participant viewer and the technology that brings it all together. A recognition of this structuring of the performative action in the performance practice, in making the recorded materials, is an attempt to bring the potential for a new performance at every occurrence of the work. An occurrence affected by variations in participation, access to the media, and the technologies that enable it. The term 'media' is used here rather than 'network' because the transfer of the materials can be across different types of media, including those entirely present in a physical space, without a network, such as the movement-responsive installation, 'Performing Audience' (Limbrick, 2014).

To determine how the recorded materials and other components function in the performative event, there have been adjustments that affect the direction of the creative work. I have said that they are not documentary texts, and also they are not made as performances to the camera. The recorded materials are made for the camera to capture, but then serve another process in the work. The term used for these materials is 'film-in-performance', in the sense that they bring audio/visual material of performative action to the entire event. The moment of the material being viewed, with computer screens or projectors, is a performative activity. The projection of the images contributes to the sense of performance, as does the sound. The technology is part of a performance that is the sum of all its elements; the extended sound, the intimacy of the images and sound, the movement of the performer and the light across the surface of the screen.

7.3.5 'In-Performance'

There are qualities in the production of the materials, as 'film-in-performance' that contribute to a new understanding of the work concept. It is useful here to consider a film, in which I perform, made by the film-maker Mike Stubbs (Stubbs, 2019), of the theatre production 'Sweat Lodge', created by 'Man Act' (Man Act, 2019). Filmed by Mike Stubbs using a camera fitted with a rubber surround to enable contact and impact with the other actors, it seems as if the camera shot is the view of a person amongst the others, the camera is the viewer's eyes, as the camera stumbles into the other actors. The camera behaves like a human character or provides a view, like a mask for the viewer of the screen. The distant viewer watching the screen is invited to step into the performance space and

participate as part of the action. There are many examples of the camera standing for the viewer's place in the visual/audio action. Previously, I have referred to the film, 'Drum Roll' (McQueen,1998), in which the viewer is placed in proximity to the sounding object, as if they are the person directly rolling the oil-drum over the ground. 'Raging Bull', directed by Martin Scorsese, is a well-known example, a film in which the camera operator (Michael Chapman,) was placed into the centre of a boxing match and filmed as if the view through the camera lens was the view of one of the boxers. (Raging Bull, 1980). The 'casting' of the camera, and by implication the observer, brings the act of being with the filmed material, as something experienced closely by the observer; there is an intimacy and proximity to the detail, energy and movement in the material. Here, the microphone is used in the same way. The materials in Case-studies 1 and Case-study 2 incorporate similar production techniques to some degree and the role of the camera and its positioning in the overall production process need to be considered from this perspective.

7.3.6 Performer Self-Awareness

The performer in the materials, is manipulating the recording materials for a productive intention, as part of a whole work that will attempt to draw an audience closer to the actions of the performer. The performer has a view of the entire production process, at the early stage of recording materials for the work, and uses technologies to close the distance between the performer's actions on the musical instruments and the audience. The intention is to draw the attention of an audience to the close physical relationship between performer and instrument, and communicate to them a sense of the decisions and knowledge embodied in the performance action. The intimacy provided by the technologies of sound and image put the audience in a relationship to the sounding objects as if they where touching them, in a process directed by the performer. This condition of self-awareness by the performer is proposed by Lavender, when he writes, 'a double-edged self, one that is both private and public, actual and virtual, exposed and contained, available but unreachable' (Lavender 2016, p.123). In order to produce a work that transcends the technological journey of the data, to arrive in the space of the viewer, there has to be some self-awareness of how my presence is articulated in the performance environment. I have to understand and manipulate the technologies of the media terrain.

To convey a sense of the technological complexity of this journey, I have set out a table that outlines the transfer of data across the network, from performance activity to the viewer. The table, reads downwards, fits a timeline, and shows the points of data transfer across the different technologies and media. It includes details of the technical variables, temporal shifts and quality adjustments at different stages in the journey. The table provides an overview in order to give a sense of the technological complexities of transferring audio/visual materials across the different components of the a technologically-enabled network. There are other technical aspects that could be added, but this table gives an indication of how variables impact the travel of data, and the consequences of accumulated durations and conversions on the difference between each end of the journey. The durations are given as ranges because there are many differences between the available technologies. The numbers given here are draw on my own experiences with different systems. All numbers given as milliseconds (ms). The table is useful in that it gives a sense of how much variation is possible, and where it might occur.

Technology	Transfer	Quality Variables	Duration
Microphone - Sound converted to electric signal. Camera - Visual materials	From movement of air using measurement of amplitude and time. Converted to images on frames of fixed data	Equipment, microphones and camera, mixers and more, determine capture quality, Distance from equipment	2 - 3 ms
Digital Interface Converted to Digital data	Blocks of data Digital 'words' governed by software clock rate, word-size, bit-depth	Effected by resolution of conversion software, impact on frequency response, dynamic range, colour matching, movement blurring.	3 – 12 ms
Encoded and sent to digital network	Optimised for Internet Using transfer protocols Data Buffering	Encoder conversion determines resolution, screen size, clock-rate, speed of transfer/potential latency	3- 20ms
Data across Internet routing	Network optimised for receiver integrity by dividing and reassembling at end address. Nodes, division, routing across networks.	Reassembly. Integrity of destination data dependent on different transfer protocols and data loss. Dependent on distance, bandwidth, speed, construction.	1 – 45ms, or more Dependent on distance
Decoding at destination	Conversion from network protocol to local computer handling, Data Buffering	Re-integration of 'data blocks' into local computer format.	3 – 10ms
Convert from digital data to electric signal and sound Images shown Sound /Image in destination space	Sound interface Visual software Sound diffusion, speakers, headphones, Spatial distances, acoustic properties	Determined by audio/visual software and variables such as clock-rate, bit-rate, word depth Local sound diffusion equipment, speakers, headphones, mixers, qualities of physical space	3 – 12ms

Table 1. Transfer performance materials across different technologies of a network

7.4 Audience Participation

The idea of shifting the role of the audience/reader towards an adjusted balance in the performance, has been investigated further with materials from both Case study 1, and Case study 2. The recorded materials were used in technological configurations that allowed them to be manipulated by the movement of the audience and performer. A large screen projection of 'Shekere' was made, using the programme MaxMSP, that allowed the performer to select short film-clips and sound files, using the movements on a real-life Shekere, present in the performance space. The instrument was both on-screen and in the physical space of the performer and audience. The performer was able to present 'close-ups' of the instrument, creating different relationships between the 'live' and projected materials. The work 'Rimshot' has been projected onto walls, as a part of an installation, where the performance is in a large scale projection of the materials, emphasising its presence in the physical space. This follows the previous discourse about the idea of 'extended cinema' and technologies that enhanced the quality and presence of the sound, with references to the works by Steve McQueen, Marclay, Cripps and others.

Another performance work, made with different versions of the audio/visual materials from 'Abstract 28X', and titled, 'Performing Audience'(2014), was made for a movement-responsive performance space. Software (Pure Data/GEM) was used to allow segments of the visual and sound materials to be selected according to movements of a viewing audience in front of the screen. As the audience moved past the large projected images, their movement caused a slow transition to other segments of the film, matched by the audio for a particular image. The slow, drifting quality of the transitions meant that the observers only become aware of their capacity to control the event after watching for some minutes and then had to work out how they could interact with it. This work was presented at Middlesex University; the notes for the performance read: 'Images overlap and it is possible to have multiple visual perspectives on the same performance, the movements becoming layered, producing a possible internalised sense of the performance. The sounds are also built over each other. Then there is a realisation that the movement and positions of the observers are controlling the changes in both image and sound; the presentation responds to the audience, joining the performer from the other recorded remote space in a new realisation' (Limbrick, 2014).

Other performances, that investigate the relationship between the performer and audience within the same physical environment have been created and presented in the period of this research (see 'Points', 'A First Show' in Chapter 5 and 'Love Songs III' in Chapter 2). These works are focussed on the potential for different orders of integration between the participants of a performative event within the context of the live performance.

7.4.1 Access as Participation

The process of accessing the materials, as URL or QR links that can be followed on a computer, falls within the boundaries of the performance event. The audience select and actively engage with the content, to less or more extent, over the internet. The action of placing the materials on a Youtube, or other social media website, needs to be considered regarding the other materials that will surround it. The work is located amongst many other materials that are selected and offered to the user as a result of the algorithms used by the site operator. This has some effect over the choice of the materials, as there are distractions and inferences made by such associations that can have some impact on the understanding of these materials. There is a possibility of misunderstanding, the materials being 'mis-read', but the compromise is that the platform makes the materials readily available for no financial cost. My practice does include works placed on websites that are exclusively used and controlled for my performance materials, as referenced later in this chapter with the 'dot-machine' work, but they are located in this way because the works operate within specific coding environments. Within the Youtube site, the participant can play/stop playback, adjust and alter tone, contrast, resolution, quality of image and sound, the speed of playback, and other technical factors, dependent on technical variation factors on their own devices.

The relationship between the performer and the audience evolves when the temporal and spatial components of a performative event have the potential to be altered by the intervening processes of mediation. This shifting of the temporal aspect of the performance is a key element , as it questions the notion that the experience of a performative event depends on all parts of its production operating at the same time and place. This thesis argues that innovations in the technologies of communication, in music

performance, and in the creative process have contributed to an evolving locus of performance in which these relationships can change.

A mediating mechanism has a distinctly separate value to that of the performer; it can be considered within its own theoretical and aesthetic framework. The performer has developed an awareness of the functioning of the system and has adapted to its operation. The performer has become aware of the technological journey across the media, with practices that include a knowledge of the transfer from studio space to that of the actively engaged audience. The artist considers the affective potential of such performance.

7.4.2 Active-Engagement

By tracking the identity of the materials across the multimedia terrain, it is possible to observe what resilience there is to the connected nature of the performance. For a performative event to have any cohesion, it needs to retain certain features of its activity in any given moment. These features are present at the broadcast end of the media, but in a situation where the observer is not passively viewing, but actively seeking to engage and interact with the performative event, it is necessary to register the properties that are resilient enough to survive the communicative process; they have to provide for the performative encounter. The characteristic features of the production at one end of the journey need to be accessible at the other end, as materials for what could be called *active-engagement*.

7.4.3 Connective Technologies

A connection of performer's creative space and audience space is enabled through an extensive range of technologies that operate in both a linear and vertical process. The idea of technology enabling a different kind of access, and for different understandings of the term *audience* in the performance event, is the focus of the research in Chapter 7, which considers the topic of how a community can be identified by its engagement with different network possibilities for creative activities. Chapter 7 considers how the audience create a community identity through *active-engagement*. The investigation of

technologically-enabled practice in relation to a participating community leads to the topic of *Community*.

8 Communities

Introduction

The heading *Community* is used to gather and articulate ideas concerned with the location, identity and engagement of the audience for musical performance. The nature of the community is affected by factors such as artistic content, technology, distribution and accessibility. Previously, in Chapter 6, three of my works were used to articulate ideas about the notion of site for a performative activity. The works were made for three physical locations, a building in Amsterdam, a disused factory in Birmingham, and a filmed interior of a contemporary house. The idea of *community* was discussed in relation to the site for creative works and this chapter develops ideas concerned with a community that is established across a cyberspace. The idea that cyberspace can sustain a site for performance is investigated here and in Chapter 7 and it is useful to note comments by Wilkie about the difficulty of establishing boundaries across the media terrain. He writes, 'cyberspace is not a site, as it is broadly non-specific' (Wilkie, 2002, p.146) but I propose that the boundaries for a performance site are established by other factors, rather than the identity of a technologically-enabled terrain as an indefinable media of data transfer. I understand that the technologies provide a clearly defined corpus of tools, applications and interfaces that support networks for data transfer and communication. There is no sense of the 'immateriality' (Stiegler, 2011, p.136) in my understanding of how the site for performance exists for these works.

Two of my works are used in Case Study 3 to focus on remotely-located materials that engage participants via internet access. In order to approach these works from the perspective of audience participation, and articulate the identity of a community that establishes itself around musical activities, I start by a reviewing the operations of a music production company and a music venue that have established their own communities. I frequently work with these organisations, and the review provides a basis on which to proceed to research around my work in Case Study 3. The practice in the context of these performance works provides access to ideas informing the identity of a community established by performative activity.

In order to understand the relationship between the audience and the performer, the enquiry focuses on factors such as occupation and engagement active within a performance locus. New technologies contribute to the operations of this relationship, though they are not the only focus of the investigation. The context for performative action includes distributive networks, specialised music forums, the paradigms of the 'live' music venue, and distributed musical products such as CDs. The performative activities in these examples are recognised by the audience. The audience and performer share a performative locus that can be a physical space or an Internet accessed 'virtual' space, such as a website. The intention in this chapter is to articulate how a community has adapted to an evolved notion of performance engagement, due to new forms of access to the performance, and the potential for closer integration into the performer's activities. As a contributor to that community, the performer has opportunities to participate, with the integration of new technologies. The performer and audience are actively engaged in the performative event, shifting the relationship between performer and audience towards that of a community determined by performance practices enabled by new technologies.

Communications technology permits the sharing of ideas and allows for like-minded individuals to recognise each other and their shared values, as part of a collective interested in pursuing performative activities. This community is identifiable by its modes of communication, but also through other outward facing constituents, such as the performances materials and social media activities visible beyond the boundaries of the immediate performance. There are materials, such as postings on websites, social media and blogs that allow observers to discover the activity and make a choice about joining it. This is often an invitation to 'subscribe' or 'sign-up', in order to join the community. As a collective entity, it produces performances that can be available for new audiences. The performance can be adjusted or controlled, at least partly, by the audience, using interactive or responsive materials, or remotely located actions. Performance is something done to be observed, to be responded to and shared. The communicative possibilities permit a community to form around the performance event.

Understanding how the technologies function provides an insight into how performance community operates. This concerns other models of access besides the Internet, and is useful to look briefly at those working with physical entities, such as

Compact Discs, and performance venues. The production of Compact Disc (CD), vinyl discs, cassette, and other physical formats of music distribution are historical examples of products providing access to musical performance. These formats have evolved with developments in design and manufacturing. They have also been revisited as formats, as they offer different qualities of sound, interaction, and types of artwork. Some of my work engages with in these formats. There is a sense that this mode of output serves communities that identify with their choice of medium.

An example of a company that carefully manages its output, in order to meet the demands of a community is the label 'Another Timbre', directed by Simon Reynell. To refer to the business as a 'label' is to recognise that there is a chosen identity that constitutes part of its value for a community. I have recorded many musical works with 'Another Timbre' and use data gathered from its operations to articulate ideas concerned with a sense of community[50]. The label is focussed primarily on the production of CDs that have simple, white card covers, with centrally placed artwork. There is no 'Barcode'[51], the design and text is concerned with the musical content, and they have a unique style that is apparent when a number of them are put next to each other on a shelf. They are part of the branding of 'Another Timbre', and convey a focus on the musical content inside the sleeve. The label initially releases up to 500 copies of most projects, and 1200 of larger scale projects. If the initial pressing sells out, more are pressed, with some projects re-pressed two or three times. There are about 250 customers who regularly buy something, with about 50 who buy everything the label produces. Around 70% of customers return for new projects. Customers are found in the key territories of the USA, Western Europe, Japan and Canada. A deliberately limited amount of materials are available from an online download service. There is some correspondence between customers and the label, but there is no open forum or blog for discussion. The label does respond to customers' enquiries about artistic content. There is a sense of a community based around the musical activity of the label and Simon Reynell, the director, gives support and value to the roles and output of the artists that he engages for projects. He has said that he is working with all the parts of the process to enable the artists and listeners to engage with each other. The focus is entirely on the choice of musical work, the artists, and the quality of the sound materials. The label has established a community that identifies with these qualities.

---

[50] Simon Reynell, interview, Oct 2016, July 2017)

[51] Barcode – a visual code used to track a product - https://en.wikipedia.org/wiki/Barcode

The example of 'Another Timbre' is not unique because it sustains its own community. It is unique because it sets itself the role of recording, supporting, and distributing the work of artists within a community of shared values. The community that has built around the label allows it to continue producing musical projects, and there is a sense of a balance between the different interests. It is not operating in order to bring about the success of one part, or for the business to make a large profit. There are many other labels that operate in a similar way, focussed on different musical genres and communities, and of course, the larger businesses intent on making large profits. Most of these businesses have moved into the more cost effective mode of digital streaming for distribution, and it is interesting to note that 'Another Timbre' deliberately stays with the CD as its main product, as a way of setting itself apart from the mainstream, and the more anonymous option of streamed downloads. The intention here is to focus on the potential for a community to be established around the activities of a music label, and not to attempt a review of different types of marketing and product branding. That is beyond the scope of this research.

Café Oto, London [52] is a venue that supports the activities of new music performance and part of a community of supporters, performers and related art activities. I have performed at the venue many times and have witnessed the collaborative efforts of the many people who make the venue function. The audience capacity of the venue is relatively small (approximately 80 people) but it operates seven nights a week and is well known throughout the UK and abroad. I have met artists working in Australia, Scandinavia and the USA, who are regularly informed of the venue's activities. The venue is sometimes used for recordings and broadcasts for the BBC. It operates a shop selling CDs, vinyl and books, and includes performance and items made by Another Timbre, as referred to in the previous writing. The venue is the centre of a community that supports the creative work, and includes the opportunity for members to participate as volunteers. It nurtures and sponsors artistic programmes, sometimes collaborating with other venues such as Dartington Summer School[53], or organisations such as MusikFabrik[54]. This venue is an

[52] https://www.cafeoto.co.uk (accessed 7/3/2021)

[53] https://www.dartington.org/whats-on/programme/summer-school/accessed 9/4/2018

[54] https://www.musikfabrik.eu/en/accessed 21/7/2021

example of a performance-based organisation that extends its operations to include performers, promoters and audience as participants sharing in an identity that defines a community. It is a community that engages with its members as participants in shared artistic practices.

The previous two models, of communities based around performance practices, give some context for the Case-Studies used in this chapter. These Case-Studies are located on remote Internet and Radio networks, and they each operate in a different mode in order to communicate with and establish their communities.

The Case Studies in this chapter are located within two different forms of technology-enabled networks. Both use the Internet for access and determination of the performative practice. The post-millennium development of better access and control over the technological terrain means that there is improved capacity for the transfer of information, with more data and faster transfer speeds. Bill Gates suggests that the issue for current technology is not the problem with the capacity, but the 'friction' of time itself as an impediment to the functioning of the network (Gates, 1996, p.191). The friction is between the cyber-systems and the human operation of it. The condition of human response is set against the concept of simultaneity across the network (Taylor, 2004, p.158). The cyber-technologies do not suffer from technical incapacity but from the relationship of them to the time of the 'real' world. As the technology improves, there is a convergence of temporal variation, and the new experience is of its homogeneity (ibid.p.158). With more detail or resolution available to the participants, the media network becomes less visible to the users, both technically transparent and the place of a communion for sensory engagement. A review of the operations of the cyber-network leads to ideas about a sense of community dependent on that network, a socio-cyber-network. It is useful here to connect with the idea of *community* in relation to the performance event as key thread through this thesis.

The internet provides an enhanced role for the audience, in which there is the possibility of control over the broadcast. The audience is in a changed relationship with the work and able to control how they engage with it, able to identify itself in the process. The audience is identifiable by its presence to the performance and its control of the

performance realisation. The individual is able to choose the extent to which they are acknowledged and identified. It is possible to understand the collective identity of individuals, engaged by their own selective process, as a *community* engaged and established by the performance.

8.1 Case Studies 1

Title	link to web address	QR Code
'Dot-machine'	http://www.marimbo.com/dot-machine	

8.1.2 Accessing and playing the 'dot-machine'

The first work to be reviewed here is 'dot-machine'. It is structured as a website-located instrument that can be controlled by anyone accessing the website. The instrument is programmed in a code called 'Flash' [55]that allows the user to download the entire instrument into their computer's short-term memory. This means that using the instrument is not dependent on having a continuous connection to the Internet. The user is then physically able to move their instrument according to their own device. This possibility for cyber-network independence allows a non-networked performance. The network would be across physical and sonically defined spaces. At the time of writing the web-link is active and the reader should interact with the web-site and downloaded an instrument. This is deliberately a simple operation of clicking on the instrument and waiting for it to operate and make sounds.

The ease of the access process, via computer terminal, is intentional in order to allow participants to come to the work, without requiring an extensive knowledge of computer programming or complicated interface protocols. The visual appearance is also deliberately made with hand drawn images of texts and boxes, using pen and paper. The

[55] 'Flash' was a programming language developed by Adobe, that enabled the integration of interactive visual and sound elements into the code that constructed a web-page. It has now been superseded by other languages, such as 'HTML 5'.

characteristic of emphasising human contact with the materials is a feature of the work that also operates in the sounds and sounding of the instrument. The audio component is made from many short sound files that are played and recorded with a close microphone technique, in order to capture the fragile and intimate sounds of objects. The intention is to put the instrument's sound into the sound space of the participant using it. There are 'internal' spatial relationships between the sounds, but these are more concerned with placing the sound-objects across a stereophonic image than putting them into reverberant 'other' spaces. It is a fairly straightforward operation to get to the point where the user can play the sound and move around the instrument. After clicking through a 'category' button, such as 'tube' (see figure 7.1 below), another grid opens that is occupied by sounds grouped under that category. The participant moves the mouse across the grid to start, and mouse-clicks to stop; almost like drawing. Multiple 'category' grids can be opened at the same time, and it can get quite cluttered, which is the participant's choice. As the diagram below shows, it is more than a single instrument and made up of nine categories of different sound-making objects. The titles indicate the nature of the source materials used to create each object.

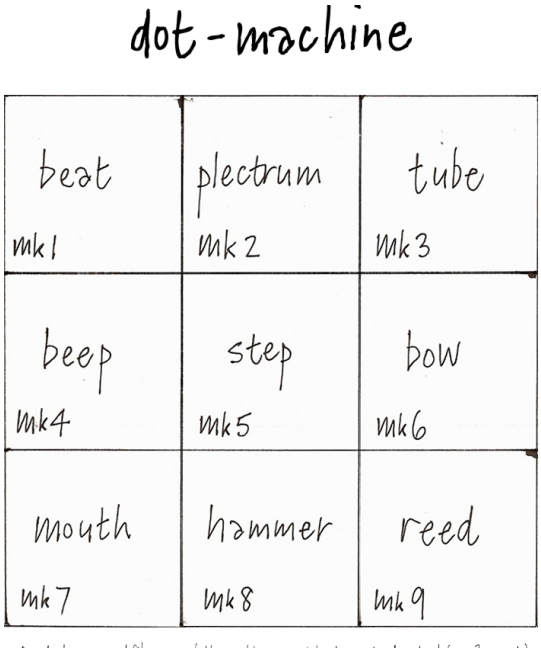

Fig. 8.1 . Visual interface of Website-located interactive musical instrument/composition, 'dot-machine'.

'Dot-machine' is part of 'Case study 3' in order to observe aspects of the practice that identify and integrate a community into the work. The work is registered for publishing purposes and has been used in many performance contexts. It has been used

to make a double CD, and broadcast on BBC Radio 3 (18th March, 2010). It has also been used for numerous live performances (Rope & Tackle Club, Sussex University, University of East Anglia and others, 2011-2017), with performers using downloaded materials or online in the performance setting, as part of dance works ('Falling About', 13th Dec, 2013).

There are examples where a community has formed around a performance, even if that is a small community that only exists for the duration of the performance. Performances have taken place in settings away from performance-oriented sites, such as work-places and offices. There is correspondence from groups of people in work offices, using the 'dot-machine' to play multiple computer performances, where everyone used their own computer terminal to individually connect to the instrument and then performed together as an ensemble, performing for themselves in their office spaces. The possibility of separate computer connections also means that the work can be dispersed across large spaces. It has been realised with performers and computers across a number of different spaces in the same site (Sonic Art Series, UEA, 2011), and was previewed for performances that would have spread across the banks of the Tyne River, in front of The Sage, Gateshead (2013). The web-accessed materials can be performed in spatial arrangement that are near or widely dispersed. They can be physically apart, with the sound travelling across the physical space, as there are other spatial values in the composition that concerned with proximal relationships; there are shared pitch-sets, rhythms and pulses that bring a notion of contact between all the possible different performing components. These are evident in the performing instructions included in a brief text below the main instrument grid. Physical and networked distance is a compositional element in the score-text; it is made for distributed performance. The web-based instrument provides materials for a shared performative activity. It is possible to interact with the instrument and other participants, and through the encounter share the activity of making a musical work. The next work in this case-study, 'Critical Waves', is related to the 'dot-machine', in that it uses the web-based instrument as part of the musical configuration for a remotely located network of live performers, encountering the work in the context of a broadcast radio programme.

8.3 Case Study 2 Critical Waves/Resonance FM/ dot-machine

There is a link to the case-study, 'Radio-based Musical Performance Community', part of a research project in conjunction with Critical Radio/Resonance FM/Birkbeck College (20 April 2015), which utilised a configuration of three musicians performing together over a cyber-network, with a 'live' link-up across their respective remotely-located sites.

Title	**QR Code**
'CriticalWaves/ResonanceFM' https://soundcloud.com/criticalwavesradio/simon-limbrick	

Performers: Simon Limbrick: marimba, Dave Morgan: guitar, Chandra Chapman: cello)

In the second work in Case study 3, aspects of technical and social functioning are considered for their impact on networked performance practice, to understand how they establish a sense of location across a seemingly scattered technological terrain. Despite the spatial and technological nature of the multi-mediated connection between the artists and performers, there is evidence of an engagement that identifies a community.

The continued trajectory of technological development contributes to the evolving site of performance practice and the accessibility for a community. The case-study reveals a sophistication of engagement that enables the richness of more conventional musical instrumental performance to be sustained within the technological environment.

As part of a large project to investigate the potential for radio broadcasting to function as a research resource, a work was made that engaged three performers sited at geographically distant locations. The musicians contributed to a live musical work that required them to connect with each other over the internet. The locations were in Norfolk, Birmingham and London. It was intentional that factors of communication latency, varying degrees of data compression - that varied the audio frequency range, producing the 'squelch' distorted signal, drop-out, and other spatial and temporal issues - were understood as constitutive elements within the structuring and sonic space of the work. After a review of 'live' musical performance software, that is supposed to facilitate

better interaction between participants, such as ‘Jamlink’, ‘eJamming’ and ‘JamKazam’, it was decided that the simplest way for all the players to connect was to use an audio-only group connection through ‘Skype’ (Skype, 2019). There are mixed reviews of the responsiveness of these specialised systems and they involve a more complicated set-up.

Part of the intention in this research project was to make the access to the musical production as simple as possible, and then observe what issues came out of the process. ‘Skype’ software prioritises the consistency of latency/temporal issues above values of signal frequency range and compression. In other words, the sound quality varies rather than the timing. As the connection is audio-only the flow of data is less likely to be restricted by factors of data-transfer and bandwidth. The programme had a 10 minute duration, and connections between the participants was only briefly lost for a short moment; there is a comment in the audio at 6’ 55” about the drop-out of one of the musicians. A fourth element, using the ‘dot-machine’ referenced above, was also added to the mix, which thereby contributed another distant location, on the server hosting the website-based ‘instrument’ based at a Technology Park in Gloucester.

After the configuration of the different components, at the various sites and across the network, it was possible to achieve some level of ensemble performance. Although there were technical issues around the sound quality and some delay and drop-out of the signal, it was possible for the performers to play together and focus on the sound content and musical organisation of the work. There is a case for proposing that the performers were incorporating the audio variations, due to the operations technological components across the network, as contributing the work. Comments by the other musicians confirm the shift of the encounter towards a state where the technical issues became a secondary factor and the focus was on the sounding materials and production of a performance work. A key observation can be made about the reader/writer relationship in regard to this performance. All participants are engaged in the making of the materials, and the audience consists of the people listening to the radio, but this is a dynamic situation and the roles can be changed. The radio-listeners can get involved, they have a choice. It would have been technically possible for listeners to join in the creative process. The piece could also exist as a shared ensemble performance without the radio broadcast. The radio station broadcasts the performance and has its own established community. The networked materials in the performance extend connections to other locations, as the performers

interact. The research in this work is to understand how the extension into other locations is possible as a result of the performative action. The musical work extends the boundaries of the community to include participants in other parts of the network. Performative technologies increase the potential for engagement and the size and identification of a community. The distributed nodes of the activity provide enough data for the communication to be sustained. The level and quality of this data can be understood as meeting a sustaining threshold that contributes to the performer/audience relationship and a sense of community.

8.3.1 Threshold

To understand how the activities at different remote locations connect and meet some threshold for the performative encounter, it is necessary to review the conditions supporting the threshold in the network itself. The 'Critical Waves' work integrates networking operations and provides a method for understanding how a threshold might be established. The work connects different nodes of activity, such as the radio recording studio, the various locations of the performers, and the integration of the 'dot-machine'. Observing the movement of the different data between these locations, and reviewing the nature of the connection helps build a model of the threshold needed to sustain it.

In this case-study, the 'dot-machine' material could be thought of as 'feeding' or 'seeding' the creative process, as part of the performative event that includes active engagement across a network. The participants contribute their own 'input', as they choose to be part of the encounter. The web-based work is set up so that anyone present at the performance can access the 'dot-machine' and create a version of the work. The action of accessing the 'dot-machine' and playing the online objects is possible because the 'dot-machine' responds quickly, and gives immediate feedback to the participants. This response is fast across the internet and seems to be enough for the participants to continue. The performers connected in the radio studio can be heard to respond to the 'dot-machine', as everyone is playing the same material. The threshold seems to be partly constituted by the ability to respond and interact. In this work, there is a sense of access to the work being done in the performance. The audience can use the same instruments and join in the musical performance. Passing the threshold seems to allow the audience and performers to work together. The relation between the performer and the audience

establishes an unbroken connection for the performative encounter. It provides for a different understanding of the relationship between all the participants , as all are identified in the performance. This shared experience can be identified as a community. A community enabled by the availability of a network that provides an acceptable threshold. In an evolved performance locus, the performer can engage with the audience, as possible participants, and integrate performance activities into the context of the community. The performer is now able to communicate and integrate their work within the community, and understanding how a technical and perceptual threshold is part of their performance domain. Acknowledging and working with the technical and communicative aspects of it has become part of my practice.

The connection between the agents in the performative event are not necessarily engaged in their efforts by the knowledge that, technically speaking, data is passing between them. The agents are concerned with the aesthetic values of the musical practice and the contents of that activity made possible by the data flow. The multimedia terrain itself contributes to the activity as an aesthetic component. Sonic 'artefacts' resulting from the networked communication are also compositional elements.

The work explores the relation of the 'writer/reader' across the radio and internet networks. It stands as a creative work, as a case study for examining the resilience, accessibility, and responsiveness of the multimedia terrain. A terrain that provides the performer/audience (or writer/reader) with enough consistent information about each other to be able to perceive, sense and participate in an interaction, above any threshold of technical and perceptual uncertainty. Above this threshold there is the possibility for a performer/audience relationship, an audience and the basis for a community.

Creative practices carried out in the localised space of the performer can extend into larger networked spaces, and some of the practice operates with some of the functionality offered by the local environment. To give an example; localised computer-based technologies - sound processing software, etc.- are also connectable across larger networked distances. It is possible for a sound-making source, even a more conventional musical instrument (such as the vibraphone featured in Chapter 5), to function locally, but also across a network. A scenario could be the sounding of an instrument by a performer; it works locally as well as remotely, by transferring the sound across the network using a

microphone and the necessary connective technologies. Another participant at the receiving end can hear the instrumental sound with a sense of simultaneity dependent on the technical 'latency' of the connection.

8.3.2 Getting technical

The characteristic features of my works, accessed across a mediated terrain, provide sensory data made available for the individuals approaching the performative event. That sensory data, though mediated across temporally and spatially varied sites and tested by technological processes, has become more detailed in terms of its sound and visual qualities. This is what the term 'resolution' refers to in this writing. The rapid increase in the speed of technological processing and communications networks has reduced the temporal factors affecting distribution and is close to reducing any perception of spatial dislocation. The effect of time differences in a local or networked technology is referred to as 'latency'. It reflects the 'technological' distance between the signal processing objects, whether they are physically near each other or at different end of a long connection in the network. There is much written about the impact of technological developments in cyber-communications, and in particular with regard to operating speeds, bandwidth and latency (Rofe and Reuben, 2017)(Appendix: 7.i Network Statistics) It would be reasonable to say that the impact of new technologies on our social environment and communicative activity is understood, to some degree, by most of the global population; especially if they are using a 'smartphone'. There are nearly nine billion mobile connections in the world, with a population of just under eight billion. This number aggregates the percentages for 'smartphones', mobiles, laptops, and many other devices, but it is enough to understand that there are more possible connections than there are people living in the world. This is a situation that has existed to for at least the last ten years (how-many-phones-are-in-the-world) (internetworldstats.com).

Technological developments continue to evolve at a rapid rate and are embedded within the social and cultural territories occupied by musical performance practices (Johnson,2017, Bauman,2000, Wu,2016). The reduction of the latency element in the network, and improved bandwidth has meant that response and interaction times are acceptable at a rate above a threshold. The connection permits other factors of the

performance, such as frequency bandwidth, dynamics and consistency of signal, to become driving factors in achieving a performative engagement.

Development of fibre-optic connectivity and speed of network processing across the cyber-network has reduced the latency between performers and audience. There are differences in timing across the network and through the various technological interfaces. The data transfer is reliant on the speed of light, as moderated by the functioning of the fibre optic cable technology. The speed of light is considered a constant figure of 299,792.458 metres/ms[56] and the velocity of light through fibre optic cable near to 199,861,638 metres/sec. Fibre-optic technology allows data transfer at about 70% the speed of light.[57] The difference is due to refraction and node amplification of the signal within the network. Currently, optimized fibre optic connections can provide up to 1Gpbs. Ultrafast fibre-optic running at 400Gbps is about to becoming available. The speeds for fibre optic connectivity can be converted into latencies that impact the sound heard by performers at each end of the connection. LOLA[58] is the most sophisticated system available (2021), and requires special hardware and a 1Gpbs symmetrical connection. It can provide a latencies of 10ms across a distance of 1000 kilometres, though this it is often greater, partly due to the fact that it is a connection for both audio and visual data. After trying many of the systems available, I have used SonoBus[59] for two years and found that it can provide latencies of around 0.18ms/kilometer. This figure varies according to the amount of data traffic on the internet, the condition of the connecting technology, the quality of the audio signal, and the number of participating locations. The latency amount can be related to the latency of sound passing through air in a physical space, and a quick way to understand the effect is to relate the network latency to some performance examples. The latency of the sound arriving at the ear from the striking of a drum by a percussionist is approximately 2ms, and between two musicians standing 10 feet apart is approximately 8ms. These calculations assume speeds of 1.125ft/ms or 0.343m/ms with an air temperature of 20c and air pressure at sea level, and are approximate because there are many small variables such as size of drum stick, and precise position of instruments used by musicians. The examples help to understand the nature of the latency in the context of an internet enabled musical performance.

---

[56] https://en.wikipedia.org/wiki/Speed_of_light
[57] https://www.m2optics.com/blog/bid/70587/calculating-optical-fiber-latency
[58] https://lola.conts.it
[59] https://www.sonobus.net

A number of institutions and technology businesses are focussed on reducing the latency below what is seen as a performance requirement of less than 30ms, using programmes such as Jacktrip[60], LOLA, JamKazam[61], SonoBus and others. A study with orchestral musicians has produced a maximum usable latency of 30ms (Rofe and Reuben, 2017), and JamKazam co-founder David Wilson, has said that Development of fibre-optic connectivity and speed of network processing across the cyber-network has reduced the latency between performers and audience. This allows me to perform at distances up to 320 kilometres, and I have been able to perform live and multi-track with latencies up to 40ms.

As a performer, I contributed to a launch for 5G mobile connectivity in an event that linked up musicians performing in the Guildhall, London, with other performers located in Berlin, Germany (5G, Notes Inegales, Guildhall, London, 22 June 2018) The network was across data systems on a mobile phone network, rather than the Internet, and attempted to reduce the latency times down to 7ms roundtrip with a high quality of the connection between the sites.

Once the communication software can be accessed, it is possible to connect across the entire world, though greater distances increase the latency, and there is a difference between server/cloud-based and peer-to-peer systems. I have achieved a 38ms roundtrip connection between the UK and Mexico, and it was possible to perform. The capacity to process more data becomes more complicated when the process operates in multiple directions. The connection is better when it is just for audio, and visual connectivity uses more data restricting the capacity of the data connection. Performers, or participants, can now play their instruments, in their own localised spaces, across the network and get enough of the sensory data and features to get a sense of musical engagement across the network. There are differences in the musical communication, but this creates a situation where other elements, besides factors such as precise synchronised timing in the performance, become more relevant for a creative outcome. The threshold for performance is focussed on factors such as listening, tuning, structuring, anticipation and responsiveness. These factors are part of other conventional versions of performance

[60] https://ccrma.stanford.edu/software/jacktrip/
[61] https://jamkazam.com

practice, but with Internet-enabled connections, there is a re-balancing of them that establishes a different model for performance, and a broader understanding of what constitutes a threshold for performative action.

The technologies of communication and sound processing have almost reached a point where their respective interactions or filtering of the performative activity have moved into the background, or, in some cases, provided new materials that aesthetically contribute to the event. This suggests that the technologies not only function as conduits or manipulators of the performers sound, but actually contribute as aesthetically charged ingredients. The sonic characteristics of the technologies contribute to the performance; entities such as 'digital artefacts', distortions due to frequency bandwidth shifts, and 'stuttering' or 'jittering' data-block transfers each have their own sonic and structural identities. They appear as independent sound objects, characterised by their frequencies and dynamic shapes, and more, but they also draw attention to the fact that the practice engages with the technologies. They can draw attention to the fact that the performance is across large networks or in communication across large physical distances, as a feature of the musical text. Artefacts such as 'stutter', system 'noise', 'glitch' and 'static' become part of the sound palette, in much the same way as those present in the sound of vinyl discs, analogue tape-recorders, cassette players, microphones and even physical environments can contribute to the musical language of a work. These elements contribute to a sense of engagement between the performer and the technology, and are available to be selected for a performance, and, for my work, can be compared to the use of acoustic and spatial phenomenon in the musical text (see Vibez Project Chapter 5).

8.4 Invisible Media - The encounter between the performer and the audience, in its changed configuration

By tracking the identity of the performance materials across the multimedia terrain, it is possible to observe what resilience there is to the connected nature of the performance. Materials present in the broadcast, where the observer is actively seeking to engage and interact with the performative event, need to be resilient enough to survive the communicative process. Understanding of how this resilience operates provides a useful insight into what is necessary for engagement to take place. The necessity for this resilience seems to operate at a higher level than the technical issues of connectivity, as

long as the connection is maintained and the digital artefacts don't impede on the general flow of the performance. The ability to continue past the technical difficulties prioritises the continuity of performative action, with a sense that they have become partly 'invisible'. The performative action is possible against a background of technical activity, as it transcends the technical media.

8.4.1 Beyond the media

Transcending the media is a process akin to transcending the separation of stage and auditorium, 'the figuring of individuals in 'their place of communion', where the individual is 'folded' into the event' (Lavender, 2016, p.15-16). Lavender is referring to Deleuzian ideas concerned with time and consciousness, that in turn have come from Henri Bergson. The 'folded' term appears in Bergson, in relation to an internalisation of an action, characterised by consciousness and duration (Bergson, 1965, p.195); 'unfolded' refers to the external awareness through the senses of a physical action. In relation to a performance, the receiver is engaged through a process of internalisation of the performance materials. The connection between event and observer forms the basis of an encounter, characterised by bodily engagement according to Andy Lavender (Lavender, 2016,p.97). To continue with Lavender, 'the event is not just watched or received, but encountered. And the encounter is one of bodily engagement' (Lavender, 2016, p. 97). He extends this concept to other media, and those related to these case-studies, 'the production produces sensation, activity and experience. This is not only the case with immersive theatre but a range of cultural productions: different kinds of live performance, sports matches, video games and, sometimes, social media interactions.'(ibid. p.97) . The potential for encounter and bodily engagement within a mediated network contributes to its capacity to sustain performative practice and the identification of the participants in the work, as a members of a community.

The reconfiguration of social structures, as a result of cyber-networking features in the book, 'Improvisation and Social Aesthetics' (Born et al., 2017), in which musician/composer/theorist, George E. Lewis writes about the development of 'ubi-comp' in San Francisco during the 1960s. Projects such as the 'League of Automatic Music Composers' attempted to set up networks between mini-computers that would communicate with each other to create musical performances. (ibid.p.93). The distance

between the computers was initially limited to the physical space for the performance, but as communication networks became faster and more reliable, the machines were connectable across remote sites. The consideration of the distance between components also became a factor in the musical production. (Born et al., 2017, p.93). Some of the key instigators, such as Rich Gold, involved in the San Francisco scene of the 1960s went on to develop computer-game strategies and social computer networks. Many of the observations made about the technologies, such as micro-computers and cyber-networks, that were becoming accessible to more people, could later be seen as applicable to a broader social context for music-making.

As the systems for communication and the machines have become faster, more reliable, with greater capacity for data-transfer, and importantly more affordable to the general population, the media terrain is accessible for anyone who can connect to it. In writing about the 1960's technologies, Simon Penny states, 'This development has led to categorically new kinds of cultural practices' (Penny, p.401). The implication of the new kinds of practices is key to the notion of an evolved site for musical performance , and a key constituent in this thesis. George E. Lewis also adds, 'in this sense [the presence of computers in everyday life], the advent of ubi-comp objects has also transformed human experience and potential' (Born et al., 2017, p.107).

8.4.2 A Distant Audience

In the field of music performance there are instances where an artist refers to the distance from the audience because of the technologies that mediate the performance. As the technologies developed, performers found new ways of crossing this distance. The technologies offered new ideas that could be incorporated into their approach to crossing that distance, even adopting them in a new understanding of their relationship to their audience. For Glenn Gould, the access and artistic control of the recording process enabled him to express his own interpretation of the piano music he performed. It enabled him to promote the musical values that he felt were more important than his presence in front of a live audience in a concert hall. Adopting a stance that embraced the technologies, he stated, 'the possibility of a greater intimacy between performer and listener and a deeper awareness of the inner workings of the music than are achievable in public performance are just two justifications' (Gould, 1979). The control of the recording process allowed

Gould to remove the unnecessary physical presence of the audience and he did not follow the view of Rubinstein, 'There never was a time, really, when I felt that reciprocal thing that Rubinstein talks of. I was never aware of that. It was not a rewarding experience but ultimately an exhausting and futile one.' (ibid.1979). With the example of Gould, there is an opportunity to hear the views of a classical musician who was aware of the changing performance context and a potential for a new relationship between his creative output and the way it was received by an audience. As a performer, he managed to articulate his understanding of these changed relationships. He engaged with technological developments that allowed him to redefine the space where the audience encountered his practice. The audience are to choose how they access his output and actively engage with their mode of listening. The audience is identified by Gould, as they participate in his mode of performance, and share an interest as a community based around his activities. The technologies contribute to an evolved notion of what constitutes a performance space, allowing Gould to understand how an audience is identified as a community that occupies it.

8.4.3 Performer and Audience Across a Network

Between the observer and the performer is the place of media, with its inherent issues concerning temporal shifting, its capability to deal with components such as sound quality and responsiveness. If performance is contained within the 'bracketed' (after Pearson, 2010) framework of its commencement and conclusion, it can exist even though it is spread across physical and technologically remote sites. The participants have choices as to how they engage with the event. This has always been the case, though it is now possible to come to this event at temporally and spatially dislocated points of access. The relationship between the performer and audience is sustained when both sides have made the decision to take part and engage with the material. The technical capabilities of the media allow for the agreement to occur at different times, without direct acknowledgement. The parties to this agreement don't have to agree to each other's participation, though the act of entering the mediated process brings configurations of ethical, technical and legal responsibilities.

The cyber-network has the potential to contain the site for an evolved notion of the performance event. From another perspective it is possible that a performance event could be seen as occupying the network; its activity is spread across it. As the performative event is dependent on all the contributing components operating together, the performative event could be said to hold the space for its action; sound holds the space around the sounding event (Ingold, 2000) and is also 'the space in which music is performed and heard … delimited by the presence of the performers and listeners' (Bielawski, 1976, in Harley, 2016, p.329). It might be said that the performance holds the event within that space; the space is filled out by the performance - with its sound, action, function of time, relations between content of musical text and realisation, physical and cultural context. The creative activity and its values are transportable, in that they cross mediating locations, in a similar way to how physical space is crossed and defined by the distance between points in a mathematically defined space.

8.5 Community of Performative Action

The heading *Community* is used to gather ideas that relate to the occupation and establishment of the site for music performance. Communication permits the sharing of ideas and allows for like-minded individuals to become part of a collective whole. This community is identifiable by its sharing of ideas partly through its communications, but also through other outward facing constituents, such as the things it produces. Performance is something done to be observed, to be shared, and contributes to the collective identity. Communication therefore permits a community to form around the performance event.

The notion of community as a sensory engagement is taken from Jaques Rancière's writing about the *sensus communis*, a community of the senses, understood as a distribution of the sensible. In *The Emancipated Spectator*, he suggests that this distribution of 'sensory fabric' defines how the community is constituted as a way of being together (Rancière, 2011, p.56-57) of 'individuals in their place of communion' (ibid. p15-16). The action is with an 'assemblage of data, intertwining of contradictory relations, to produce a sense of community' (ibid. p.59). Rancière's ideas support the notion of a community founded on the sensible and the aesthetic, ideas that can be used in the

context of different communities that negotiate their contact through networks and multimedia.

The cyber-network supports the transfer of the data at an increasingly faster rate. The consistency and speed of the operating threshold that supports a consistent encounter between performer and spectator reinforces the operation of the shared connection across the network, and the idea of that being a basis for a community of shared interests. For the networked performance, this relationship and its position within the mediated structure can be understood as a 'community between human beings; a community of sense, which defines their way of being together' (ibid. p.56- 59). The community in this instance is across the entire media network, as meaningfully located individuals, it provides for an experience of being located 'meaningfully within a community' (Lavender, 2016, p.142). Andy Lavender proposes that a refusal of the media occurs when the spectator is folded into the event (Lavender, 2016, p.142).

Rancière writes of the communitarian essence transcending the separation of stage and auditorium, and therefore emancipating the audience from its secondary role: 'True community … does not tolerate theatrical mediation (Rancière, 2011, p.3). This speaks of an equality between the performer and the spectator, understood through a shared sensibility. The network, as the focus in this chapter, is a site for the sharing of performative activity, and is concerned with the musical activity that produces a musical 'work'.

Here the 'work' can be understood as the result of a musical activity with duration and an encounter between the performer and the audience. It is used here to consider performative activities that establish a networked community. For the activity to be substantiated as aesthetic cultural production, an act of *poiesis*, as a musical 'work', there needs to be a connection for sharing information between the participants in the event. There is a consequence as a result of the connections of the shared information being part of this creative production. The media that facilitates the arrangement has a dynamic relationship to the contents of the 'work'; some characteristics of the networked components might contribute to its aesthetic values; for instance digital audio artefacts introduced as data is moved across the terrain. The potential for system generated data (noise) and a revised balance of input between the performer/spectator means that it is

necessary to find other approaches for acknowledging the practical sounding instrumentation and authorship values in the creative 'work'.

The activity put into the structuring, coding and installing of the technological components is part of the compositional practice. The eventual impact of those efforts might be perceived in 'real-time', as the result of interaction in the live unfolding of the piece, whether the effort was over a previous period of development, or instantaneous building and decision-making during the performance. The evolved technologies and the shared connectivity across the multimedia network have implications for the authorship of a musical work. As the input/output aspect of networked performance becomes more resilient, supporting a sharing community, it also has to address concerns about how different values, both cultural and economic, are to be negotiated.

In the cyber-network, there is the possibility of the writer and reader occupying the same communal space, the stage and auditorium are no longer divided. This shift was addressed by Benjamin, back in the 1930's, when he suggested that with the increased mechanisation of printing, everybody could become a publisher, that part of their work was to be able to write about what they did: '… the distinction between writer and readership is thus in the process of losing its fundamental character' (Benjamin, 2008, p.23). The cyber-network provides a space for an aesthetic community without the conventional concepts of stage and auditorium, without the hierarchies of conventional performer/audience relationships, and without the physical and sociological boundaries of conventional performative spaces. Music technologies provide a platform for alternatives to the conventional performance arrangements, both in the located activities and creative practices of musical performance. These alternatives also support new composer and audience relations, allowing their configurations to adapt and modify according to the functioning of the technologies and the creative process.

This raises the idea of a community that shares this realigned set of practices. The composer and electro-acoustic music theorist, Simon Emmerson, addresses the notion of a community defined partly by its engagement with electro-acoustic compositional practices and its constitutive range of musical technologies. He writes of a 'community of interest' (Emmerson, 1989, p.142) which shares expectations, as it 'engages in a phase of the compositional process, that involves perceiving the intermediate objects and relating

them to accumulated experience '(ibid., p.189). Emmerson proposes this view on a revision of the composer/audience relation and states, 'that communication between composer and audience rests to some extent on a common code or at least common expectations and assumptions' (ibid., p.135). The community is constituted by members with different roles and the focus for Emmerson is on the task of 'testing in the musical process'. While the compositional activity is 'firmly in the area of the composer's poiesis', with their 'previous experiences', it is done with 'reference to other members of the community (composers, performers and listeners)' (ibid. p135).

8.5.1 Composers build machines build communities

Emmerson's use of the phrase 'common code' suggests there are languages and codes used for operating the different components of the network. Joel Ryan worked in the same setting as the 'League of Automatic Composers', at Mills College, California, and offers a use of the word 'code' that points to its application in different but related contexts. He spoke of the 'strange paradox', that 'real-time' interaction requires the encoding of musical ideas into a non-musical computer code, that then has to be translated into the symbolic code for the action of temporal and embodied live performance (Ryan, 1992, p.414-418, *in* Salter, 2010). The relationship between the codes of machines and the 'common code' used in the performer/audience environment gives some understanding of why they can overlap. The language used outside the machine-based media can resemble the language used to operate the machine, and vice-versa. Of course 'code' is an example, but the contemporary performer, engaging with computer technologies as part of their performative practice, uses terms such as 'interface', 'resolution', 'sample-phase', and even more technical terms such as, 'data buffer', 'random-access', or 'probability'. These are not the same as the symbolic terms used to describe the audio aspects of a performance. There is an extensive range of texts that set out categories, definitions, taxonomic properties and constituents of sound, especially in the fields of electronic and electro-acoustic music (see Chion, 1990, (Emmerson, 1989, Smalley, 1996, Machover *in* Roads, 1985, et al.). These terms aren't necessarily shared as a 'common code' by the community sharing the performance, but there is a requirement for new symbolic terms that allow participation. The nature of the performative activity is partly defined by the spoken language of its participants. Any new language used in this way is also a property of the audience and establishes its identity. The language exists for

the performer and the audience, even if it is not part of the text for the score and its realisation. My practice includes live 'text' comments, either visible or spoken, and 'in-ear' spoken instructions during the actual performance.

With Emmerson, there is a notion of community identified by a range of creative musical practices that are mediated, or translated even, by a shared language that spans the technologies and the phenomenological interactions. As the technical processes expand outwards to become components of a broader network, they remain bounded by the activities of the community. The 'accumulated experiences' and 'common expectations' (Emmerson, 1989, p.135) provide a language that has value across the network. It could be understood as the premise for a local and technologically-enabled community of musical performance being applied to an expanded network of remotely located participants. The restriction being that there is a threshold below which the 'community of interest' would struggle to maintain its engagement.

The 'community of interest' from Emmerson, the 'sensible community' of Rancière, and the rebalancing of Benjamin's notion of reader and writer, share some similarities in their configurations, when their differences are compared to the older conventions of broadcast and receivership in the place of performance. There is a clear realignment of the values afforded the different agents who encounter each other in the creative practice. To draw some of these ideas together, it could be said that performative activity is established by a community that encounters the musical 'work' across a network. The performative act transcends the presence of a multimedia network.

The implications for the 'community', established by its collective individuality, its shared sensibility, the shift of the writer/reader balance, and access to a communicative immediacy has produced a potential performance space without stage or auditorium. Rancière marks this as a shift of social values, when he speaks of 'a solitary place that creates new forms of socialization, a new awareness of the capacity of any/everyone (Rancière, 2011, p.59) The altered conditions of this place are characterised by factors that are as much related to social and cultural shifts as they are to changes within musical performance. Concepts relating to the performative space, as it is physically constructed and well as for aesthetic activity, contribute to the idea of a context for performance.

Rancière's text could be used to describe a network-based location, where new relationships are formed through shifted social structures and modes of communication. It could be applied to a new community established by technologically enabled access to performance activities.

8.5.2 Access

The potential for new modes of access offers a 'new capacity' for audiences who have become restricted by conventional performance environments, for aesthetic, social, health and other reasons. Technology plays a key role in facilitating the access of participants with physical or mental impairments to creative activities. I have worked creatively with musicians who have restrictions of some kind, and are able to participate because of innovative technologies for interfaces and new instruments. As this part of the community has been engaging with innovation and functionality of communicative technologies for many decades, it is in strong position to interface with performance activity across the network. Recognising the potential for this community to engage in a process that allows it to bypass the difficulties of physical access, and integration into existing performative contexts, opens the way to a changed context for creative work. Networks provide a mode of access that is a continuation of the development of technological instruments and support. There are many implications as a result of this, and articulating them fully is beyond the scope of this thesis. The fact that there is a 'new capacity' for a community that integrates new modes of communication supports the notion of it providing a new locus for performance activity. In the domain where accessibility is necessary for participation, it is possible to find one of the strongest examples for the viability of an evolved locus, with its own community. The potential for improved accessibility is not only applicable to any one group of participants, and is relevant to any community forming around a performative activity. The arguments made for engagement between the performer and the audience, to the extent that both are considered participants as part of a community, is possible because of the access provided by the technologies.

Summary

This chapter has addressed 'community' and focussed on the shift of the boundaries for contemporary musical performance, into a terrain that includes new technologies for communication and media operations. The functioning of the multimedia terrain has been analysed for its capacity to allow musical activity between participants, and the establishment of a community as a constitutive element of the locus established by of performance. It has articulated ideas about the nature of the performative locus, to understand how its boundaries include new possibilities for the identification of an audience and the community it establishes. In order to validate that performative action is taking place, that it is viable, various qualities have been assessed. The writing has not only been concerned with technological issues, focusing on those concerned with the transfer of the performer's sound and communication data to enable a sense of performative encounter. A threshold for communicative data, and resilience to the technological context needs to be understood, to enable the transfer of complex information concerned with proximity and presence between the performer and the audience. The nature of this transfer, as it transcends the media and technological processes, provides for engagement, participation and the identification of a community for the performative event. The evolved status of these elements contributes to a locus established by the performative activity within its community.

The transference data across the nodes of a contemporary cyber-network can provide a method for understanding the nature of the relationships across that network. The focus on the internal operations of the network does not exclude the review of any operations outside it. It is possible to view operations outside the network that have changed, shifting relationships. As networks become more accessible, then new modes of performance activity become possible. This is the opportunity for disruption, where the previous paradigms and systems leave a space for other ideas to come forward. Ideas concerned with the relationship between these systems, such as 'hysteresis' and 'disruption', become part of the language of performative practice.

As the performer, I have become more aware of the functioning of the network and have integrated into my practice. As shown in the case studies, I make works that exist on the Internet, with different possibilities available for the performative actions. As a

performer, I have become more aware of the effect of my activity as it connects to the community present for my works. I have a better understanding of how to produce performative values that engage and allow the observer to participate.

I return to Benjamin, as he writes of the 'exiled' actor (Benjamin, 2008, .p18), isolated from his performative presence in front of a theatre audience, the mechanical process removing the 'aura' of unique artistic creativity. In contrast, a performer looking into the 'testing' of the lens at the start of the Internet journey can, by controlling aspects of the process, be able to engage with a community. The complexity of the mechanical operation, and cultural specialisation of the camera have been simplified and made available for most people to experiment and use for their own purposes. Connecting both ends of the media journey and able to transcend or incorporate the sense of distance as a factor in the value of the production.

The 'testing' camera becomes a metaphor for the roving eye of cyber-communication and interface; the accelerated connectivity of cyberspace now becomes a joined-up conduit for passing data to the community. It operates in both directions; the performer is connected to the observer, with the ability for the sender and receiver in a communicative space that can be interactive. Benjamin comments on the adjustment brought about by new technology when he refers to the changed balance. His observations on the effect of developments of printing technologies anticipated a situation similar to cyber technologies, addressing the way they facilitate the movement of information. He states 'the distinction between writer and readership is thus in the process of losing its fundamental character', and '…becoming a functional one, assuming a different form from one case to the next … the reader is constantly ready to become a writer' (Ibid, p. 23).The possibility of such a shift in their relationships means that the operations of key constituents of the performative locus need to be re-calibrated. This shift has an impact on the materials passed between them, including the nature of the musical work, the musical text, and the community established by the performative action.

The Performer

This chapter concludes with a review of the performer's role, as many of the innovations and shifts in the multimedia domain have an impact on the nature of the

community established by the performer's actions. In adopting new technologies for communication and the production of musical materials, the performer's position in the performative environment has changed. The Performer has new modes of access and new instruments. The performer is engaged in the process of making a musical work with others, as a participant in a community. The score-text, the musical intentions and the performance environment are made accessible and open to all the participants in that encounter. A fundamental idea in this process is that the performer has an understanding of the operations across the multimedia domain; the instruments and interfaces are part of the productive apparatus. Many of the elements of more conventional performance practice are present but they are shifted across time, space and technical capacity. In the changed context, the performer considers variations of distance and time between the broadcast, reception, and spatial contexts of the participants. There is a consideration for the 'creative spaces' within the musical materials, and questions to ask about the workings of the musical text, to understand the shift of author/reader balance, especially in its relation to participation and a community established by the practice.

The degree to which these constitute new skills for the performer is discussed in Chapter 4, and Tod Machover has written that 'More than ever before, the composer is asked to play many roles simultaneously: researcher, instrument builder, performer, theoretician, as well as creator' (Tod Machover *in* Roads, 1985). Additional to this list is an acknowledgement of the community in which the practice emerges.

This chapter has considered how the relationship between the performer and the audience evolves as part of a community, when the temporal, spatial and qualitative components of a performative event have the potential to be altered by processes of technological mediation. Any changes to this relationship would contribute to the principal argument in this thesis, as it is argued that innovation of the technologies of communication, music performance, and the creative process have contributed to an evolving locus manifest by performance.

As an example of a performer who understood the relationship between his practice and the audience that engaged with it, I refer to the words of Buster Keaton. Like Glen Gould, he was able to understand how his artistic practices could operate with the potential of new technologies, in order to communicate to an audience. He managed to

transfer his practice from one performance medium to another, understanding the factors that engaged his audience. He recognised that the new technologies presented another way to develop his work, and that distributing it as projected film would enable him to engage with a community looking for new ways to experience it. I have used my own case studies to articulate ideas about present day technologies that I can use to understand and communicate with a performance-based community. My work engages with the new technologies in order to establish a performance space for the community, and question the possibilities that are available.

Buster Keaton, carried his experience of performance from the medium of the stage performance to the medium of film-making. In the famous scene, when the house falls and misses him in 'Steamboat Bill, Jr.' (Keaton, 1928) - made six years before Benjamin's text - Keaton understands the process of the journey across the multimedia terrain of his time. This chapter uses ideas about that journey to understand a new terrain. This chapter concludes with a quote from Keaton that captures the essence of this rejuvenation of performer knowledge, and creates a theoretical space, bounded by the opening quotation by Walter Benjamin, in which to investigate networked performance practices:

> *Well, the making of a motion picture started to fascinate me immediately. So I stuck with them and went in and out of that picture. First thing I did was I asked a thousand questions about the camera and got into the camera. Then I went into the projecting room to see things cut. It just fascinated me. For a finish I asked them to break my contract, let me out of the show, and I stayed with Arbuckle. (Buster Keaton, Interviews, p182)*

9. Conclusion

This thesis has addressed the argument for the notion of an evolved musical performance practice. The focus of the research has been on the practice of a performer active in the production of new music performance. In order to proceed, it was necessary to define how the performer was integrated into the research process and to set out a definition of the site established by performance activity. Along the timeline of my career, as a performer, composer and educator, there have been events and projects that have exposed new practices and alternatives to the conventional paradigms of the Classical Music concert venue. These experiences have been used to provide evidence, along with the case-studies made during the course of the research period. The practice has formed the basis for an auto-ethnographical methodology used to investigate and articulate the argument that the locus for the new music has evolved.

It was possible to identify conditions that informed the activities of the performer and observe the relationship between them, as part of a wider cultural context. The term *locus* was used to identify a space in which these parameters could co-exist; it represents the space generated by the conditions informing the nature of the activities and relationships in the performance event. Understanding how the locus can represent the multivalent operations of the performance event is key to the structure of this research. The title of this thesis refers to *loci* and a possibility of multiple perspectives operating in relation to each other. The plural use of this term gives some idea of the complex nature of performance and acknowledges that there are many ways to understand how it is located. It is a place informed by concepts such as the notional space 'delimited by the presence of the performers and listeners (Bielawski, *in* Harley, 1994, p.329), and the theoretical space proposed by Foucault in *Of Other Spaces*, with 'a set of relations by which a given site can be defined' (Foucault, 2003, p.23), as well as other spaces defined by sound and movement.

The presence of the performer in this *locus* of performance was central to the investigation, which was structured around the practical work in the case-studies. In each case the investigation addressed the performer's practice and each contributes evidence that is directly taken from the activities and research needed to create the musical works. The performer contributed musical instrumental skills, experience and performance

research as knowledge embodied in the performative activity. The research in this thesis is based on that knowledge and practice.

Each chapter has focused on case-studies that contribute to different critical perspectives on the *locus* of performance. The musical works have been set out in order to look into different subsets of conditions and parameters that inform the practice. These conditions have been evaluated for their contribution, to observe any evidence of changes in their operation. The production of musical works has been part of the performer's continued practice, so the works are available as musical pieces that can be listened to, viewed and performed in as part of the performer's ongoing research.

In Chapter 2, there were examples of change in the development and use of music technologies. These included factors such as easier accessibility due to lower financial costs and economies of scale, a reduction in the physical size, and the establishment of a growing community of users. The engagement with different types of instrument control meant that the technologies started to mirror their qualities
In the functioning of the software and the corpus of sounds available. Sound libraries started to feature unusual percussion sounds and incorporate sound control parameters that allowed better responses to the attack of drumsticks. New instruments are being built that use a percussionist's skills to trigger surfaces and control data, extending the range of technological access. It is possible to identify some major changes in instrument design. Design has changed dramatically changed since the 1990s, though many of the instruments continue to be integrated into a conventional form of musical performance. The instruments have evolved but they are used within the traditional paradigms of performance.

The exception, and the sign of later change, is an example of practice carried out in the Netherlands. A less rigid attitude to the performance event, in terms of compositional practices, performer/ audience relations and its physical location meant that there was more scope for experimentation and exploration of a new performance dynamic. The musical work with Harry De Wit, both then and now (see Chapter 6), exemplifies a particular mode of creativity that engages with the entire performance environment. The creative materials are entangled with properties of the physical site, the distances and scale of the architecture, the acoustic properties, and, to some degree, the

compositional material, such as melody and harmony. A disciplined sense of improvisation and a collaborative input are also encouraged. These practices have evolved from small scale art galleries, clubs and experimental theatre to the major theatres and festivals around the world. This approach is influenced by creative practices from other disciplines, such as experimental theatre, and the increased interest in musical disciplines related to free improvisation and jazz.

As a creative approach to musical composition and performance, these ideas are taken up across the world, in many locations where western classical music has been the tradition. Such influences have had an impact on performing practices in subsequent decades. In the UK, theatre groups such as *Lumiere and Son, Moving Being* and *Hesitate and Demonstrate*, adopted some of these musical approaches in site-specific contexts, and music performance groups such as *Bow Gamelan* and *Test Department* broke out of conventions of performance composition and context. From the historical examples it is possible to see how the development of a new dynamic in the production of music coincides with a search for a new performer/audience relationship. There are still conditions in this practice that are governed by the paradigms of the performer broadcasting the artistic idea to the receiving audience. Although the audience might move around or not sit in rows of chairs, they are still understood as the readers in the creative process. There are many variations of this relationship but it is not until the technologies of communication and a democratisation of the creative tools for making music in the early 1990s that there starts to be a shift in the idea of the roles of composer, performer and audience.

The historical case studies have provided evidence of dramatic changes in the conditions such as technology and the potential for a reconfiguring of the performance space and composer/perform/audience relationship. These developments continue into the practices of the later case-studies in Chapter 5. The musical works in these case-studies provide a sharper perspective on the operations of the different conditions, as they are focussed directly on the processes of making new musical works.

In Chapter 5, the practice is used to identify and investigate specific conditions. Each case study is assigned a particular focus, initially, it wasn't necessarily clear which particular piece of work would reveal anything about its constitutive conditions. The

process was a form of testing, which produced evidence in the form of identification and assessment of how the conditions they had evolved. The following list of conventions was applied across the case-studies, leading to ideas about the conditions and whether they had changed.

- nature of identity in the musical work
- musical object as text
- concept or experience
- performer as 'interpreter'
- technique and virtuosity
- relationship between performance, performer and audience
- nature of 'liveness'
- temporal and spatial components
- musical resources and technologies
- interface
- mediation
- communication

As work with the case studies progressed the discussion accumulated and it was possible to apply ideas and discussion across the later examples. Once a topic like *identity* had been discussed in the first case-study, it was possible to extend that discussion. The process of working on the pieces and keeping the theoretical reading in the same space was partly achieved by making large posters that had specific collections of relevant annotations (see Appendix 2. Posters). These were placed around the studio space so that it was possible to find texts that were relevant to the activity and then note it on paper. The annotations were selected as potential ideas for critiquing the conditions of the practice.

It became clear that the conditions and ideas that informed the practice could be considered in their relation to each other. Conditions concerned with the participants were grouped with ideas about identity and presence under the heading of *community*. Those concerned with the instruments, components and other apparatus were grouped under *technology,* and those concerned with the skills and creative work placed under

practice. This taxonomy does not construct a precise definition of the *locus* but it does reflect the nature of these conditions coming into proximity of each other and give some understanding of how they affect each other. As the research developed and more materials were available it was also possible to observe the differences in the way these different groupings operated. This led to research about the effect of the different dimensions operating in ways that were asynchronous and terms like *friction* and *hysteresis* being applied.

Time, which has been a factor in the change of these dimensions, is also the reason they are often in disconnection with each. There are arguments for this disconnection to be seen as a motivation for creativity, but there is no oversight; this is not an 'aesthetic community structured by disconnection' (Rancière, 2011,p. 59). There is a blindness to the workings of this assemblage, it is more the *hysteresis* of Bourdieu, in which the shift of one part of the cultural field puts another behind and allows the dominant to take advantage (Bourdieu, 1993, p.38). This can be understood by the example of the condition of communication in the place of the *locus.* If communication becomes better resourced, faster and more easily accessed, then information for the performance event can be distributed more quickly. If that communication apparatus permits the performance materials to be distributed at a rate quicker than the rest of the structure informing the locus, then how many of the participants access the performance? The entire locus will be distorted by this situation.

As suggested, the taxonomy and its headings are not a fixed structure, they convey a sense of how things relate and change. The final stages of the work started to shift this structure and offered another set of headings. They were *location, participants, materials* and *purpose,* a four way grouping. Again, it was possible to regroup the conditions and factors under these headings and observe which affected the structure and the operations of the other conditions. This methodology continues to produce interesting ways to rethink the structure of the *locus* of performance.

Topics such as the inviolability of the one-way compositional process, a reconsideration of the balance of the author and reader, performer/ audience/ participant relations, improvisation, technology, performance environment and community have

been addressed in this research as a way of understanding how performance has evolved. The enquiry has been carried out in the place where the musical work has been produced, allowing the questions to challenge the nature of the author's own creative output. The questions have challenged the multivalent nature of musical performance practices and therefore have a value for the author to reflect on the evolved nature of the conditions informing future performance events. The nature of some of the changes and the indications of *hysteresis*, or disconnection between the different dimensions of the performance event lead to further questions about the role of the audience as participants, and performers as composers. Technology continues to provide an opportunity for the *locus* to transform itself, though it is not the only driver of change, as is apparent by the relevance of other topics in this thesis.

The implications of the argument for an evolved *locus* for performance are that the conditions that inform it need to be understood and observed, to allow access for all participants to encounter and develop new models for musical performance.

Bibliography

Adams, J. & Sanders, F. K. (1975) *John Adams speaking: Pound's sources for the Adams cantos*. Orono: University of Maine Press.

Adorno, T. W. et al. (2003) *Philosophy of modern music*. Athlone contemporary European thinkers. New York: Continuum.

Adorno, T. W. (1991) *The Culture Industry.* Abingdon, New York: Routledge.

Agamben, G. (2002) *L'aperto:L'uomo e l'animale*. Torino: Bollati e Boringhieri.

Agamben, G. (2005) *State of exception*. Chicago: University of Chicago Press.

Agamben, G. & Albert, G. (2003) *The man without content*. Meridian, crossing aesthetics. Repr. Stanford, Calif: Stanford Univ.

Aranda, J. et al. (eds.) (2015) *The internet does not exist*. E-flux journal. Berlin: Sternberg Press.

Assange, J. (2012) *Cypherpunks: Freedom and the Future of the Internet*. New York, London: Times Group Books.

Assange, J. (2014) *When Google met WikiLeaks*. New York: OR Books.

Augé, M. (2008) *Non-Places. An Introduction to Supermodernity.* London, New York: Verso.

Auslander, P. (2008) *Liveness: performance in a mediatized culture*. 2nd ed. London ; New York: Routledge.

Auslander, P. (ed.) (2005) *Performance: critical concepts in literary and cultural studies*. London ; New York: Routledge.

Auslander, P. (1994) *Presence and Resistance: Postmodernism and Cultural Politics in Contemporary American Performance*. Ann Arbor MI: University of Michigan.

Bachelard, G. (1958) *The Poetics of Space*. Beacon Paperback. Penguin.

Badiou, A. (2013) *Being and Event.* London, New York: Bloomsbury Academic.

Bailey, D. (1993) *Improvisation. Its Nature and Practice in Music.* US: Da Capo Press.

Bateson, G. (1972) *Steps to an Ecology of Mind*. New York: Ballantine.

Baudrillard, J. (2007) *The Ecstasy of Communication*. Los Angeles: Semiotext(e).

Bauman, Z. (2000) *Liquid modernity*. Cambridge, UK : Malden, MA: Polity Press ; Blackwell.

Benjamin, W. (2008) *The Work of Art in the Age of Mechanical Reproduction*. Penguin books great ideas. London: Penguin.

Bennett, S. (1997) *Theatre audiences: a theory of production and reception*. 2nd ed. London ; New York: Routledge.

Bergson, H. et al. (2014) *Bergson - Key Writings*. London ; New York: Bloomsbury.

Bielawski, Ludwik (1976) *A zonal theory of time and its importance for musical anthropology(Strefowa teoria czasu i jej znaczenie dla antropologii muzycznej)*. Krakaw: PWM.

Biggs, M. et al. (eds.) (2010) *The Routledge companion to research in the arts*. 1st ed. New York: Routledge.

Blake, A. (1992) *The Music Business*. London: Batsford.

Blesser, B. & Salter, L.-R. (2009) *Spaces Speak, Are You Listening?. Experiencing Aural Architecture*. Massachusetts, London: MIT Press.

Born, G. et al. (eds.) (2017) *Improvisation and social aesthetics*. Improvisation, community, and social practice. Durham: Duke University Press.

Born, G. (ed.) (2015) *Music, sound and space: transformations of public and private experience*. First paperback edition. Cambridge: Cambridge University Press.

Borwick, J. & Association of Professional Recording Studios (eds.) (1987) *Sound recording practice*. 3rd ed. Oxford ; New York: Oxford University Press.

Boulez, P. & Deliège, C. (1976a) *Conversations with Célestin Deliège*. London: Eulenburg Books.

Boulez, P. (1971) *Boulez on Music Today*. London: Faber

Bourdieu, P. (1990a) *In other words: essays towards a reflexive sociology*. Stanford, Calif: Stanford University Press.

Bourdieu, P. (2010) *Outline of a theory of practice*. Cambridge studies in social and cultural anthropology 16. 25. printing. Cambridge: Cambridge Univ. Press.

Bourdieu, P. (1990b) *The logic of practice*. Reprinted. Cambridge: Polity Press.

Brecht, S. (1982) *The Theatre of Visions: Robert Wilson*. London: Methuen.

Brooks, P. (1990) *The Empty Space*. 2nd edition. London ; New York: Harmondsworth, Penguin.

Butcher, S.H. (2018) *Aristotle, Poetics*. Pub: Seltzer.

Brynjolfsson, E. & McAfee, A. (2014) *The Second Machine Age.* New York, London: W.W. Norton & Co.

Byrne, D. (2013) *How music works*. New York: Cannongate

Cabanès, J.-L. (1998) *Surface et intériorité*. Presses Univ de Bordeaux.

Cage, J. (2009) *Silence. Lectures and Writings.* London: Calder and Boyars.

Cage, J. & Charles, D. (1981) *For the Birds*. London: Marion Boyars.

Campbell, E. (2013) *Music after Deleuze*. Deleuze encounters. New York: Bloomsbury Academic.

Carlson, M. (2004) *Performance: a critical introduction [1996]*. 2nd ed. New York: Routledge.

Carpenter, E. et al. (1973) *Eskimo realities*. 1st ed. New York: Holt, Rinehart and Winston.

Carpenter, E. & McLuhan, M. (1960) *Acoustic Space in Explorations in Communication.* Boston: Bacon Press.

Certeau, M. de (1988) *The Practice of Everyday Life.* Los Angeles, London: California Press, University of.

Chion, M. (1990) *Audio-Vision. Sound on Screen.* New York: Columbia University Press.

Chion, M. (2009) *Film, A Sound Art.* New York: Columbia University Press.

Clayton, M. et al. (2005) In time with the music: the concept of entrainment and its significance for ethnomusicology. *European Meetings in Ethnomusicology*. 113–142.

Collins, J. (n.d.) *Birmingham Popular Music Archive BPMA*

Cook, N. (2013) *Beyond the score: music as performance*. New York: Oxford University Press.

Cott, J. (1974) *Stockhausen: Conversations with the composer*. Pan Books Ltd.

Cox, C. & Warner, D. (eds.) (2004) *Audio culture: readings in modern music*. New York: Continuum.

Coyne, R. (2010) *The Tuning of Place. Social Spaces and Pervasive Digital Media.* Massachusetts, London: MIT Press.

Cripps, S. & Reimann, S. B. (2017) *Stephen Cripps: performing machines*. Wien: Verlag für Moderne Kunst.

Crispin, D. & Gilmore, B. (eds.) (2014) *Artistic Experimentation in Music:An Anthology*. Leuven: Leuven University Press.

Davies, C. (1988) *High tech architecture*. London: Thames and Hudson.

De Landa, M. (1997) *A Thousand Years of Non-Linear History*. 2014th edition. New York: Zone Books.

De Landa, M. (2003) *War in the age of intelligent machines*. Swerve editions. 5. print. New York, NY: Zone Books.

Debord, G. (1977) *The Society of the Spectacle.* Michigan: Black & Red.

Deleuze, G. (2009) *Cinema 1: The movement-image*. Cinema Gilles Deleuze ; 1. Repr. London: Athlone.

Deleuze, G. (1986) *Cinema 2, L'Image-temps*. Minneapolis: University of Minnesota.

Deleuze, G. (2011) *Difference and repetition*. Continuum impacts changing minds. Repr. with corr. London: Continuum.

Deleuze, G. & Guattari, F. (2013) *A thousand plateaus: capitalism and schizophrenia*. London: Bloomsbury Academic.

Deleuze, G. & Guattari, F. (1994) *What is philosophy?* European perspectives. New York: Columbia University Press.

Dell, S. et al. (eds.) (2008) *On location: siting Robert Smithson and his contemporaries*. London: Black Dog Publ.

Derrida, J. (2001) *Writing and Difference.* London, New York: Routledge.

Diederischen, D. (2015) Music- Immateriality - Value. *Berlin:Sternberg Press*.

Dijck, J. van (2013) *The culture of connectivity: a critical history of social media*. Oxford: Oxford Univ. Press.

Doğantan, M. (ed.) (2015) *Artistic practice as research in music: theory, criticism, practice*. SEMPRE studies in the psychology of music. Farnham, Surrey, UK ; Burlington, VT: Ashgate.

Doherty, C. (ed.) (2004) *Contemporary art: from studio to situation*. London: Black Dog.

Emmerson, S. (1989) Composing strategies and pedagogy. *Contemporary Music Review*. 3(1) p.133–144.

Emmerson, S. (2007) *Living Electronic Music*. Aldershot, Hants, England ; Burlington, VT: Ashgate.

Farman, J. (2012) *Mobile interface theory: embodied space and locative media*. New York: Routledge.

Farnell, A. (2010) *Designing Sound*. Massachusetts, London: MIT Press.

Fischer-Lichte, E. (2008) *The Transformative Power of Performance: A New Aesthetics*. London: Routledge.

Foucault, M. (1986) *Death and the Labyrinth: The World of Raymond Roussel*. Bloomsbury Publishing.

Foucault, M. (2003) [1967]. *Of Other Spaces*. Baltimore, USA: John Hopkins University Press.

Foucault, M. (1989a) *The Archaeology of Knowledge.* London, New York: Routledge.

Foucault, M. (1989b) *The Order of Things.* New York, London: Routledge.

Freshwater, H. (2009) *Theatre & audience*. Theatre&. Houndmills, Basingstoke, Hampshire, UK ; New York: Palgrave Macmillan.

Gates, B. et al. (1996) *The Road Ahead*. The Road Ahead. Penguin.

Gehm, S. & Husemann, P. (2012) *The Politics of Collective Attention*. Katherina von Wilke (ed.). Berlin: Die Deutsche Bibliotek.

Giannachi, G. et al. (eds.) (2012) *Archaeologies of presence: art, performance and the persistence of being*. London ; New York: Routledge.

Giannachi, G. & Kaye, N. (2011) *Performing Presence: Between the Live and the Simulated*. Manchester: Manchester Univ. Press.

Glancey, J. (1998) *20th C architecture: the structures that shaped the century*. Woodstock, N.Y.: Overlook Press.

Goehr, L. (2007) *The imaginary museum of musical works: an essay in the philosophy of music*. Rev. ed. Oxford ; New York: Oxford University Press.

Goehr, L. D. (2007) *The imaginary museum of musical works: an essay in the philosophy of music*. Rev. ed. Oxford: Oxford Univ. Press.

Goffman, E. (1990) *The presentation of self in everyday life*. Repr. London: Penguin.

Goldman, J. (2011) *The musical language of Pierre Boulez: writings and compositions*. Music since 1900. Cambridge, UK ; New York: Cambridge University Press.

Goldsmith, M. (2012) *Discord. The Story of Noise*. UK: OUP.

Griffiths, P. (1985) *Modern music: a concise history from Debussy to Boulez*. World of art. New York, N.Y: Thames and Hudson.

Griffiths, P. (1995) *Modern music and after*. Oxford ; New York: Oxford University Press.

Grouix, P. & Maulpoix, J.-M. (1998) *Michaux*. ENS Editions.

Guthrie, W.K.C. (1950) *The Greek Philosophers, from Thales to Aristotle.* Norwich, New York: Fletcher & Son, Methuen & Co.

Hainge, G. (2013) *Noise Matters.Towards an Ontology of Noise.* New York, London: Bloomsbury Academic.

Hallam, J. (n.d.) Mapping City Space: Independent Filmmakers as Urban Gazetteers'. *Journal of British Cinema and Television*.

Harley, M. A. (1994) *Space and Spatialization In Contemporary Music: History and Analysis, Ideas and Implementations*. Los Angeles: Moonrise Press.

Heathfield, A. (ed.) (2004) *Live: art and performance*. New York: Routledge.

Heidegger, M. (1927) *Being and Time.* 2010th edition. Albany, New York: New York Press, State University of.

Hendricks, J. et al. (eds.) (n.d.) *Fluxus Scores and Instructions. The Gilbert and Lila Silverman Fluxus Collection, Detroit.* Roskilde, Denmark: Museet for Samtidskunst.

Hill, L. & Paris, H. (2006) *Performance and Place*. Performance Interventions. Palgrave Macmillan UK.

Hinderliter, B. et al. (eds.) (2009) *Communities of sense: rethinking aesthetics and politics*. Durham: Duke University Press.

Husserl, E. (1964) *The Phenomenology of the Consciousness of Internal Time*. Bloomington: Indiana University Press.

Huxley, M. & Witts, N. (eds.) (2002) *The twentieth-century performance reader*. 2nd ed. London ; New York: Routledge.

Iddon, M. et al. (2013) *John Cage and David Tudor: correspondence on interpretation and performance*. Music since 1900. Cambridge: Cambridge University Press.

Ingarden, R. (1986) *Work of Music and the Problem of Its Identity*. Hampshire, UK: Palgrave Macmillan, a division of Macmillan Publishers Limited.

Ingold, T. (2011) *Being Alive. Essays on Movement, Knowledfe and Description.* Oxford, New York: Routledge.

Ingold, T. (2007) *Lines, A Brief History.* Abingdon, New York: Routledge.

Ingold, T. (2000) *The Perception of the Environment. Essays on Livelihood, Dwelling and Skill*. Abingdon, New York: Routledge.

Johnson, S. (2002) *Emergence: the connected lives of ants, brains, cities and software*. London: Penguin Books.

Johnson, S. (1997) *Interface culture: how new technology transforms the way we create and communicate*. 1st ed. San Francisco: HarperEdge.

Johnson, S. (2017) *Wonderland: how play made the modern world*.

Kahn, D. (2001) *Noise Water Meat. A History of the Sound Arts.* Massachusetts, London: MIT Press.

Kant, I. (2007) *Critique of Pure Reason.* Marcus Weigelt (ed.). London: Penguin Classics.

Kaprow, A. (1966) *Assemblages, Environments and Happenings*. New York: H.N.Abrams.

Kaye, N. (2007) *Multi-Media: Video - Installation - Performance*. London: Routledge.

Kaye, N. (1994) *Postmodernism and Performance*. Basingstoke: Palgrave Macmillan.

Kaye, N. (2000) *Site-Specific Art: Performance, Place and Documentation*. Routledge.

Keaton, B. & Sweeney, K. W. (2007) *Buster Keaton: Interviews*. Conversations with filmmakers series. University Press of Mississippi.

Keirsey, D. & Keirsey, D. (1998) *Please understand me II: temperament, character, intelligence*. 1st ed. Del Mar, CA: Prometheus Nemesis.

Kelleher, J. & Ridout, N. P. (eds.) (2006) *Contemporary theatres in Europe: a critical companion*. London ; New York: Routledge.

Kenner, H. (1985) *The poetry of Ezra Pound*. Lincoln: University of Nebraska Press.

Kittler, F. A. (1999) *Gramophone, film, typewriter*. Writing science. Stanford, Calif: Stanford University Press.

Kreidler, J. (2009) *Loadbang. Programming Electronic Music in PD.* Hofheim: Wolke Verlag.

Kwon, M. (2004) *One Place After Another. Site-specific art and locational identity.* Massachusetts, London: MIT Press.

LaBelle, B. (2013) *Acoustic Territories/Sound Culture and Everyday Life*. New York, London: Bloomsbury Academic.

LaBelle, B. (2015) *Background Noise. Perspectives on Sound Art.* 2nd edition. New York, London: Bloomsbury Academic.

Lailach, M. & Grosenick, U. (2007) *Land art*.

Langsdorf, L. & Smith, A. R. (1995) *Recovering Pragmatism's Voice: The Classical Tradition, Rorty, and the Philosophy of Communication*. SUNY Press.

Lavender, A. (2016) *Performance in the twenty-first century: theatres of engagement*. London ; New York: Routledge.

Lefebvre, H. (2013) *Rhythmanalysis. Space, Time and Everyday Life.* New York, London: Bloomsbury Publishing.

Lefebvre, H. (1991) *The Production of Space.* MA, Oxford, Victoria: Blackwell Publishing.

Lefebvre, H. (2003) *The Urban Revolution.* Minneapolis, London: Minnesota Press, University of.

Lefebvre, H. (1996) *Writings on Cities*. Wiley.

Leman, M. (2008) *Embodied Music Cognition and Mediation Technology*. Massachusetts, London: MIT Press.

Lewis, G. & Piekut, B. (2016) *The Oxford Handbook of Critical Improvisation Studies*. Oxford handbooks. Oxford University Press.

Lippman, Edward (1952) *Music and Space: a Study in the Philosophy of Music*. Columbia University.

Lippman, Edward (1963) Spatial Perception and Physical Location as Factors of Music', AcM, xxxv (1963), 24–35 (on JSTOR). *AcM*. (xxxv), .

Lippman, Edward (1999) *The Philosophy & Aesthetics of Music*. University of Nebraska Press.

Lyotard, J.-F. (2005) *The postmodern condition: a report on knowledge*. Theory and history of literature. Repr. Manchester: Manchester Univ. Press.

Martin, J.-H. (ed.) (2004) *Spazi Atti/ Fitting Spaces.7 artisti italiani alle prese con la transformazione dei luoghi*. Padiglione d'Arte Contemporanea, Milano: Comune di Milano.

Mason, P. (2015) *Postcapitalism. A Guide to Our Future.* London: Allen Lane, Penguin Books.

Mason, P. (2013) *Why It's Still Kicking Off Everywhere. The New Global Revolutions.* London, New York: Verso.

Matossian, N. (1990) *Xenakis*. New York, London: Kahn & Avrill.

McDonald, K. (2016) *Film theory: the basics*. The basics. London ; New York: Routledge, Taylor & Francis Group.

McDonald, K. (2006) *Global movements: action and culture*. Malden, MA ; Oxford: Blackwell Pub.

McLuhan, M. (1962) *The Gutenberg galaxy: the making of typographic man*. Reprinted. Toronto: Univ. of Toronto Pr.

McLuhan, M. et al. (1967) *The medium is the massage: an inventory of effects*. Corte Madera, Calif: Gingko Press.

McLuhan, M. (2010) *Understanding media: the extensions of man*. Routledge classics. Repr. London: Routledge.

Merleau-Ponty, M. (2012) *Phenomenology of Perception.* Abingdon, New York: Routledge.

Mitchell, D. (2012) *Everyday Phenomenology*. Cambridge Scholars Publishing.

Mitchell, W. J. T. & Hansen, M. B. N. (eds.) (2010) *Critical terms for media studies*. Chicago ; London: The University of Chicago Press.

Mulhall, S. (2013) *Heidegger's Being and Time*. Abingdon, New York: Routledge.

Nash, R. (1967) *Wilderness and the American Mind*. New Haven, London: Yale University Press.

Nyman, M. (1999) *Experimental Music. Cage and Beyond.* 2nd edition. Cambridge: Cambridge University Press.

Ojala, J. (2009) *Space in musical semiosis: an abductive theory of the musical composition process*. Imatra: International Semiotics Institute at Imatra : Semiotic Society of Finland : Dept. of Musicology, University of Helsinki.

Ojala, J. (2008) 'Spatial embodiment of musical semiosis.', in *Music-senses-body. 9th International congress on musica signification.* 2008 Roma: Imatra: International Semiotics Institute and Roma: Univerità di Roma for Vergata and Umweb Publications

Pearson, M. (2010) *Site-Specific Performance.* Hampshire, New York: Palgrave Macmillan.

Peters, D. et al. (2013) *Bodily expression in electronic music: perspectives on reclaiming performativity*.

Phelan, P. (1993) *Unmarked: The Politics of Performance*. London: Routledge.

Pierre-Quint, L. et al. (1927) *L'Art Cinématographique. 2*. Vol. 2. Paris: F.Alcan.

Plato (1970) *The Dialogues of Plato, Volume Four, The Republic.* M Hare & DA Russell (ed.). London: Sphere Books Ltd.

Porter, R. (1997) *Rewriting the Self: Histories from the Renaissance to the Present*. Psychology Press.

Prest, J. & Thompson, H. (2000) *Corporeal practices: (re)figuring the body in French studies*. P. Lang.

Rancière, J. (2011) *The Emancipated Spectator*. London: Verso.

Rasmussen, S. E. (2005) *Experiencing architecture*. Cambridge, Mass: MIT Press.

Rauning, G. (2007) *A Thousand Machines. A Concise Philosophy of the Machine as Social Movement.* Los Angeles: Semiotext(e).

Rehm, R. (1994) *Greek tragic theatre*. Theatre production studies. 1. paperback publ. London: Routledge.

Reisz, K. & Millar, G. (2010) *The Technique of Film Editing*. Focal Press. Focal Press. Richardson, E. (2013) *3 Church Walk*.

Rink, J. (ed.) (2002) *Musical performance: a guide to understanding*. Cambridge ; New York: Cambridge University Press.

Roads, C. (1985) *Composers and the Computer*. New York: William Kauffman.

Roberts, L. (ed.) (2015) *Mapping cultures: place, practice, performance*.

Ross, A. (2012) *The Rest is Noise.* London: Fourth Estate, Harper Collins.

Ross, D. (1971) *Aristotle*. University Paperbacks 65. Reprinted. London: Methuen.

Roussel, R. (1914,1983) *Locus Solus*. Calder Publications Ltd

Ryan, J. (1992) 'Effort and Expression: Some Notes on Instrument Design at STEIM.', in *Proceedings of the 1992 International Computer Music Conference, ed. A. Strange*. 1992 San Francisco: International Computer Music Association. pp. 414–418.

Salter, C. (2010) *Entangled: technology and the transformation of performance*. Cambridge, Mass: MIT Press.

Sanden, P. (2013) *Liveness in modern music: musicians, technology, and the perception of performance*. Routledge research in music 5. New York: Routledge.

Schaeffer, P. (1952) *In Search of a Concrete Music*. Vol. First Journal of Concrete Music (1948-1949) Second Journal of Concrete Music (1950-1951) The Concrete Experiment in Music (1952). Los Angeles: University of California Press.

Schaeffer, P. (2017) *Treatise on musical objects: essays across disciplines*. California studies in 20th-century music 20. Oakland, California: University of California Press.

Schafer, R. M. (1977) *The Soundscape. Our Sonic Environment and the Tuning of the World.* Vermont: Destiny Books.

Schechner, R. (2006) *Performance studies: an introduction*. 2nd ed. New York: Routledge.

Schechner, R. (2009) *Performance theory*. Routledge classics. London: Routledge.

Schechner, R. & Brady, S. (2013) *Performance studies: an introduction*. 3. ed. London: Routledge.

Schechner, R. & McNamara, B. (1977) General Introduction to the Performing Arts Publication Series. *MIT Press*. 1 (3), .

Slater, M. (2002) Presence and the Sixth Sense. Presence: Teleoperators and Virtual Environments 11 (4) p.435–439.

Smalley, D. (1997) Spectromorphology. Explaining sound-shapes. *Organised Sound*. 2 (2), 107–126.

Smalley, Denis (1991) Spatial experience in electro-acoustic music. *L'Espace du Son II, ed. F. Dhomont*.

Smith, E. (2004) *Coda: Talking Sound History.* Athens,London: Georgia Press, University of.

Sonnenschein, D. (2001) *Sound Design. The Expressive Power of Music, Voice and Sound Effects in Cinema.* CA: Michael Wiese Productions.

Sorrell, N. (1990) *A Guide to the Gamelan*. Faber & Faber

Stephen Connor (1997) *The Modern Auditory I, in Rewriting the Self: Histories from the Renaissance to the Present*. Vol. I. London: Routledge.

Steuer, J. (1992) Defining virtual reality: Dimensions determining telepresence. Journal of Communications 42 p.73–93.

Stiegler, B. & Barker, S. F. (2011) *Technics and time, 3: cinematic time and the question of malaise*. Meridian, crossing aesthetics. Stanford: Stanford University Press.

Stock, C. (2011) Creating new narratives through shared time and space: Performer/audience connection in multi-site dance events. *Creative Industries at Queensland University of Technology*.

Stone, R. (2015) *Auditions: architecture and aurality*. Cambridge, Massachusett: The MIT Press.

Tan, S.-L. et al. (2010) *Psychology of music: from sound to significance*. Hove, East Sussex [England] ; New York, NY: Psychology Press.

Thompson, E. A. (2004) *The Soundscape of Modernity: Architectural Acoustics and the Culture of Listening in America, 1900-1933*. MIT Press.

Thorne, S. (2010) *Acousticity: Ecologies of Listening*. Liverpool: Liverpool John Moores.

Toop, D. (2010) *The Membership of the Listener*. New York, London: Continuum.

Voegelin, S. (2010) *Listening to Noise and Silence. Towards a Philosophy of Sound Art.* New York, London: Continuum.

Walton, J. M. (2015) *The Greek Sense of Theatre: Tragedy and Comedy Reviewed*. Third edition. Abingdon, Oxon ; New York, NY: Routledge.

Wilkie, F. (2002) Mapping the Terrain: a Survey of Site-Specific Performance in Britain. *New Theatre Quarterly*. 18 (2), 140–160.

Wim van Der Meer (2004) 'The Location of Music: Towards a Hybrid Musicology', in *The Time, Place and Culture of Music*. 11 November 2004 p.

Wishart, T. (1996) *On sonic art*. Contemporary music studies v. 12. New and rev. ed. Simon Emmerson (ed.). Amsterdam: Harwood Academic Publishers.

Wittgenstein (2001) *Wittgenstein, Theory and the Arts*. Abingdon, New York: Routledge.

Wittgenstein, L. (1989) *Philosophical Investigations*. 3nd ed., repr. Cambridge, Mass: Blackwell.

Wittgenstein, L. et al. (2007) *Tractatus logico-philosophicus*. New York, NY: Cosimo Classics.

Woodfin, R. & Groves, J. (2013) *Introducing Aristotle*.

Wörner, K. H. (1973) *Stockhausen. Life and Work*. Faber & Faber.

Wuorinen, C. (1979) *Simple composition*. Longman music series. New York: Longman.

Xenakis, I. (1992) *Formalized Music: Thought and Mathematics in Composition*. Harmonologia series. Pendragon Press.

Yates, F. A. (1992) *The art of memory*. Pimlico ed. London: Pimlico.

Websites and Internet Sources

About — Royal Opera House. Available from: http://www.roh.org.uk/about (Accessed 14 February 2016).

Ambisonics. Available from: https://en.wikipedia.org/wiki/Ambisonics (Accessed 14 February 2016).

Area 10 Project Space. Available from: https://www.artrabbit.com/organisations/area-10-project-space (Accessed 30 September 2015).

Berliner Philharmoniker - Berliner Philharmoniker . Available from: http://www.berliner-philharmoniker.de/en/ (Accessed 14 February 2016).

Bow Gamelan Ensemble (2015). Wikipedia, the free encyclopedia [online]. Available from: https://en.wikipedia.org/w/index.php?title=Bow_Gamelan_Ensemble&oldid=655643994 (Accessed 12 September 2015).

Dogtroep Dogtroep . Available from: https://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=search&rurl=translate.google.co.uk&sl=nl&u=https://nl.wikipedia.org/wiki/Dogtroep&usg=ALkJrhidnxqsnnj9PWJG2F96Iob2qpOZOw (Accessed 12 September 2015).

EINSTÜRZENDE NEUBAUTEN Available from: https://neubauten.org/en/biography.

Janice Kerbel | Turner Prize 2015 | TateShots | Tate. Available from: http://www.tate.org.uk/context-comment/video/janice-kerbel-turner-prize-2015-tateshots (Accessed 14 February 2016).

Keirsey Temperament Website - Portrait of the Artisan® Performer (ESFP) . Available from: http://www.keirsey.com/4temps/performer.aspx (Accessed 12 December 2015).

Leap Motion . Available from: https://developer.leapmotion.com/documentation/cpp/devguide/Leap_Overview.html?proglang=current (Accessed 14 February 2016).

Louvre Museum | Paris. Available from: http://www.louvre.fr/en/parcours (Accessed 14 February 2016).

Man Jumping (2016) Available from: https://en.wikipedia.org/w/index.php?title=Man_Jumping&oldid=721896241 (Accessed 30 September 2016).

Manfredi Clemente: About. Available from: http://manfrediclemente.blogspot.com/p/about_6.html (Accessed 14 April 2016).

Oculus Rift | Oculus. Available from: https://www.oculus.com/en-us/rift/ (Accessed 14 February 2016).

SOUNDkitchen. Available from: http://soundkitchenuk.org/?page_id=2417 (Accessed 14 April 2016).

Stanford Laptop Orchestra | Biography. Available from: http://slork.stanford.edu/bio/ (Accessed 14 April 2016).

Tate Modern. Available from: http://www.tate.org.uk/context-comment/search?f[]=im_vid_46:1846&solrsort=is_end_date%20asc,%20is_start_date%20asc,%20is_published_date%20desc (Accessed 14 February 2016).

Test Department. Available from: http://testdept.org.uk.

Urban Sax Site Officiel. Available from: http://urbansax.com/ (Accessed 12 September 2015).

WWW Ircam: Who are we?. Available from: http://www.ircam.fr/ircam.html?&L=1 (Accessed 27 January 2016).

Bachrach, A. & Fontbonne, Y. (2012) What is entrainment ? definition and applications in musical research. *Empirical musicology review.* 7 (1–2), 49–56Available from: https://kb.osu.edu/dspace/bitstream/handle/1811/52979/EMR000137a-Clayton.pdf (Accessed 7 September 2015).

Bean, A. *Bow Gamelan*. Available from: http://www.annebean.net/past-projects/1981-1990/192.

Bergson, H. et al. (1965) *Duration and Simultaneity: With Reference to Einstein's Theory*. Library of liberal arts, 199. Bobbs-Merrill. Available from: https://books.google.co.uk/books?id=ZaLXAAAAMAAJ.

Bergson, H. (1929) *Matter And Memory*. Library of Philosophy. George Allen & Unwin Limited. Available from: https://books.google.co.uk/books?id=eR-aAwAAQBAJ.

Bergson, H. & Pogson, F. L. (2018) *Time and Free Will*. e-artnow. Available from: https://books.google.co.uk/books?id=46WSDwAAQBAJ.

Bianchi, M. (2006) *The Active Consumer: Novelty and Surprise in Consumer Choice*. Routledge Frontiers of Political Economy. Taylor & Francis. Available from: https://books.google.co.uk/books?id=LOuFAgAAQBAJ.

Bloch, T. (n.d.) *ONDES MARTENOT **** THOMAS BLOCH --- the instrument : videos, pictures, works, facts...* [online]. Available from: http://www.thomasbloch.net/en_ondes-martenot.html (Accessed 14 February 2016).

Bourdieu, P. & Johnson, R. (1993) *The Field of Cultural Production: Essays on Art and Literature*. European Perspectives: A Series in Social Thought and Cultural Criticism. Columbia University Press. Available from: https://books.google.co.uk/books?id=6kHKmIMNoBYC.

Brayshaw, T. & Witts, N. (2013) *The Twentieth Century Performance Reader*. Taylor & Francis. Available from: https://books.google.co.uk/books?id=PTIiAQAAQBAJ.

Chadabe, J. (1997) *Electric Sound: The Past and Promise of Electronic Music*. Prentice Hall. [online]. Available from: https://books.google.co.uk/books?id=eAwJAQAAMAAJ.

Clayton, M. (n.d.) '*Experience and meaning in music performance ... Entrainment - roughly speaking, the synchronisation of autonomous rhythmic processes - is a well- established ...*', in p. [online]. Available from: www.open.ac.uk/Arts/experience/entrainment.htm.

Clifton, T. (1983) *Music as Heard: A Study in Applied Phenomenology*. Yale University Press. [online]. Available from: https://books.google.co.uk/books?id=Bj-pAQAACAAJ.

Collins, J. (n.d.) *Birmingham Music Archive | Celebrating Birmingham's Popular Music History* [online]. Available from: http://www.birminghammusicarchive.com/ (Accessed 21 June 2016a).

Cook, N. (1998) *Analysing Musical Multimedia*. Clarendon Press. [online]. Available from: https://books.google.co.uk/books?id=xY2fAAAAMAAJ.

Ellis, C. et al. (2011) Auto-ethnography: An Overview. *FQS*. 12 (1, Art. 10), . [online]. Available from: https://www.qualitative-research.net/index.php/fqs/article/view/1589/3095 (Accessed 29 August 2020).

England, H. E. F. C. for (n.d.) *REF impact* [online]. Available from: http://www.hefce.ac.uk/rsrch/REFimpact/ (Accessed 1 April 2017).

Furness, Telegraph, H. (n.d.) *Southbank launches 'virtual reality' orchestra as director vows to keep up with digital world - Telegraph* [online]. Available from: http://www.telegraph.co.uk/news/newstopics/howaboutthat/12128254/Southbank-launches-virtual-reality-orchestra-as-director-vows-to-keep-up-with-digital-world.html (Accessed 14 February 2016).

Gale, M. B. et al. (2016) *The Routledge Drama Anthology: Modernism to Contemporary Performance*. Drama and theatres studies. Routledge. [online]. Available from: https://books.google.co.uk/books?id=JJwdswEACAAJ.

Gallie, W. B. (1964) *Philosophy and the Historical Understanding*. Chatto & Windus. [online]. Available from: https://books.google.co.uk/books?id=kaxmAAAAMAAJ.

Glasgow, T. 25 A. D. (2014) *Tramway - A History* [online]. Available from: http://www.tramway.org/Pages/Tramway---A-History.aspx (Accessed 30 September 2015).

Hall, S. P. (n.d.) *Aeschylus' Oresteia trilogy*. [online]. Available from: https://screenplaystv.wordpress.com/2012/01/23/oresteia-channel-4-1983/.

Mocrep (n.d.) *Mocrep* [online]. Available from: http://www.mocrep.org/who/ (Accessed 14 February 2016).

Nancy, J. L. et al. (2009) *Listening*. Perspectives in Continental Philosophy. Fordham University Press. [online]. Available from: https://books.google.co.uk/books?id=g1g0TZaKvd4C.

Neuhaus, M. (n.d.) *Max Neuhaus, audio/video recordings* [online]. Available from: http://www.max-neuhaus.info/audio-video/ (Accessed 14 April 2016).

Nielsen, E. L. (2015) *Hinges of correlation: Spatial devices of social coexistence*. (8), . [online]. Available from: http://www.researchcatalogue.net/view/99363/99364.

Rodowick, D. N. (1997) *Gilles Deleuze's Time Machine*. Post-contemporary interventions. Duke University Press. [online]. Available from: https://books.google.co.uk/books?id=CHxCud6l88wC.

RODOWICK, D. N. & Rodowick, D. N. (2009) *The Virtual Life of Film*. Harvard University Press. [online]. Available from: https://books.google.co.uk/books?id=V5iwBnpVczoC.

Saunders, J. & Limbrick, S. (n.d.) *surfaces, a long durational musical work in which a performer produces sounds from different surfaces.* [online]. Available from: http://www.sonicsurfaces.co.uk.

Schatzki, T. R. (2010) *The Timespace of Human Activity: On Performance, Society, and History as Indeterminate Teleological Events*. Toposophia: Sustainability, Dwelling, Design. Lexington Books. [online]. Available from: https://books.google.co.uk/books?id=VwlxaZQh9MUC.

South Bank Centre (n.d.) *Southbank Centre 2016/17 Classical Music Season* [online]. Available from: http://www.classicalsource.com/db_control/db_news.php?id=3513 (Accessed 14 February 2016).

Squib-box (n.d.) *squib-box* [online]. Available from: http://www.squib-box.com/ (Accessed 14 February 2016).

Theremin, L. (n.d.) *Theremin* [online]. Available from: https://en.wikipedia.org/wiki/Theremin (Accessed 14 February 2016).

Thorne, S. (2005) *Man Act* [online]. Available from: http://www.simonthornemusic.co.uk/manact.html.

Upton, E. (2013) *The Amazing Acoustics of the Epidaurus Theatre*. [online]. Available from: http://www.todayifoundout.com/index.php/2013/12/amazing-acoustics-epidaurus-theatre/ (Accessed 14 September 2015).

Wainwright, O. et al. (2015) Meet the Turner prize shortlist, from the musician to the mind-reader. *The Guardian*. 28 September. [online]. Available from: http://www.theguardian.com/artanddesign/2015/sep/28/turner-prize-2015-artist-interviews-assemble-nicole-wermers-bonnie-camplin-janice-kerbel (Accessed 22 November 2015).

Williams, G. (2016) 'Kant's Account of Reason', in Edward N. Zalta (ed.) *The Stanford Encyclopedia of Philosophy*. Spring 2016 Metaphysics Research Lab, Stanford University. p. [online]. Available from: https://plato.stanford.edu/archives/spr2016/entries/kant-reason/ (Accessed 13 March 2017).

Music Scores

Berio, L. (1973) *Linea per due pianoforti, vibrafono e marimba*. Music Score. Universal Edition

Boulez, P. (1953) *Le Marteau Sans Maitre*. Music Score. Paris: Universal Edition. Boulez, P. (1945) *Première sonate: pour piano*.

Dillon, J. (1978) *TiReTiKeDha*. Music Score. Peters Edition.

Ferneyhough, B. (1992) *Bone Alphabet*. Music Score. Peters Edition.

Globobar, V. (1981) *Tribababum extensif sur rythme phantôme*. Music Score. Italy: Riccordi

Hoyland, V. (1988) *WorkOut: for Marimba and MalletKat*. Music Score.

Muldowney, D. (1978) *A First Show*. Music Score. London: Novello & Co Ltd.

Oliveros, P. (2013) *Anthology of Text Scores*. Music Score. New York: Deep Listening Publications.

Smith, L. C. (2006) *Dirt Road*. Music Score.

Stockhausen, K. (1960) *Kontakte*. Music Score. Germany: Stockhausen-Verlag.

Stockhausen, K. (1959) *Nr. 9 Zyklus für einen Schlagzeuger.* Music Score. London: Universal Ed.

Audio Media/Recording

Stockhausen, K. (1956) *Gesang der Jünglinge. Electronic Music.* Germany: Stockhausen-Verlag.

Cage, J. & Tudor, D. (1959) *Indeterminacy. Washington DC, USA*. Smithsonian Folkways Recordings

Perkis, T. et al. (2007) *The League of Automatic Composers 1978-1983*. New York: New World Records

Presentation/Performance

Limbrick, S. (2015) '*Between Soundings*', in 2015 Middlesex University.

Limbrick, S. (2014) '*Performance Space*', in 2014 Middlesex University.

The Appendices are available as .zip files accessible with the following link:

research.marimbo.com

Appendix 1

Skin Gregory White

Track 3, 6 and 7

Island of Silhouettes Ruta Vitkauskaite

Track 2

Algo Vibes Angus Stewart

Track 1 and 8

Points Simon Limbrick

Track 4 and 5

Appendix 2

Posters – Evolving Practice

Max4Live Patches- Evolving Practice