

ImMApp: An Immersive Database of Sound Art

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Contents

Details of External Documentation: Electronic Technical Appendices	v
Guide to the DVD	vi
Table of Figures	vii
Acknowledgments	x
Abstract	xi
Chapter 1: Introduction.....	1
1.1.1. Project Aims & Originality.....	1
1.1.2. Four Scenarios.....	2
1.1.3. Thesis Overview.....	3
1.2. Sound Art: An Introduction.....	5
1.2.1. Sound Art: Definitions, Delimitations and Connectivities.....	7
1.3. Digital Immersion: An Introduction	11
Chapter 2: Theoretical Framework: Foucault's Historical Method.....	14
2.1. Why Foucault?.....	15
2.1.1. The Archive.....	15
2.1.2. The Study of Surfaces.....	16
2.2. Foucault: Key Terms & Their Relation to Sound Art.....	17
2.2.1. Discourse.....	18
2.2.2. Archaeology.....	19
2.2.3. The Statement.....	20
2.2.4. Genealogy as Comparative Archaeology.....	21
2.2.5. Foucault: Weaknesses of the Method.....	22
2.3. Proposed Schema.....	24
2.3.1 Concepts.....	24
2.3.2. Themes.....	25
2.3.3. Subject Positions.....	25
2.3.4. Institutions and Apparatuses.....	25
2.3.5. Surfaces of Emergence.....	26
2.3.6. Strategies.....	26
Hollywood Model.....	26
High Culture Model.....	26
Underground Model.....	26
Public Model.....	27
Institutional Model.....	27
2.3.7. Practices.....	27
2.3.8. Paradigms.....	27
2.3.9. Techniques.....	28

2.3.10. Materials.....	28
2.3.11. Canons.....	28
2.4. Foucault: Summing Up.....	29
Chapter 3: Sound Art: A Review of Print-based Discourse.....	30
3.1. <i>Sound by Artists</i> : 1990: Artist-Functions & Institutions.....	31
3.1.1. <i>Sound by Artists</i> : Associated Institutions.....	34
3.1.2. <i>Sound by Artists</i> : Analysis.....	35
3.2. <i>Noise, Water, Meat</i> : 2001: Themes & Subject Positions.....	36
3.2.1. Noise: Dada, Futurism, Synaesthesia, Recorded Sound & John Cage.....	36
3.2.2. Water: Pollock, Fluxus, Intermedia.....	37
3.2.3. Meat: Burroughs, Artaud and McClure, but No Escaping Cage.....	38
3.2.4. <i>Noise, Water, Meat</i> : Analysis.....	38
3.2.5. Kahn & Lander: Comparisons.....	39
3.3. <i>Background Noise</i> : 2006: Paradigms & Forms of Specification.....	40
3.3.1. Statements, Artist-Functions and Paradigms: Micro, Meso and Macro.....	40
3.3.2. Labelle's Forms of Specification.....	41
3.3.3. <i>Background Noise</i> : Analysis.....	43
3.4. Chapter 3: Conclusions.....	44
3.5. Deleuze and Guattari: Major, Minor & Minoritarian	47
Chapter 4: Sound Art: Gutenbergiana to Digitalis.....	51
4.1. Marshall McLuhan: Print Media, Messages, Sense Ratios.....	52
4.2. <i>The Australian Sound Design Project (ASDP)</i>	55
4.3.1. How a Digitised Methodology Contributes to an Enhanced Discourse Analysis... 56	
4.3.2. The <i>ASDP</i> 'Functions': Tagging, A Developing Ontology.....	59
4.3.3. The Primacy of the Auditory and the Visual.....	60
4.3. <i>soundtoys.net</i>	61
4.4.1. Tagging on <i>Soundtoys.net</i>	62
4.4.2. Two Explorations of Digital Space: Data as Creative Material.....	64
4.4. Chapter 4: Conclusions.....	66
Chapter 5: Practice Review: From Digital Surface to Digital Immersion.....	67
5.1. Project Beginnings: The Database & Gathering Data.....	68
5.2. <i>Surface</i>	71
5.2.1. <i>Surface</i> : Introduction.....	71
5.2.2. Multimedia.....	73
5.2.3. Cross Referencing: Nodes.....	74
5.2.4. Ethics.....	76
5.2.5. Genealogical Timeline.....	77
5.2.6. Genealogy 2: A History of Statements	78

5.2.7. Artist-Functions, Statements and Institutions	79
5.2.8. Surface: A Variable Ontology	82
5.2.9. <i>Surface</i> : Conclusions.....	82
5.3. <i>Immersion</i>	83
5.3.1. HTML/PHP→ XML via XSLT: Deriving Useful Semantic Data from <i>Surface</i> ..	85
5.3.2. X3D (eXtensible 3D).....	86
5.4. Chapter 5: Conclusions.....	87
Chapter 6: Sound Art within <i>Immersion</i>	89
6.1. Foucault's Archaeological Method Revisited.....	93
6.2. Water InfoClash: <i>Immersion</i> vs. Kahn.....	97
6.3. A Minor History of Sound Art.....	102
6.4. Chapter 6: Conclusions.....	109
Chapter 7: Conclusions, Limitations & Future Work.....	112
7.1. <i>Surface</i> : The Dataset	114
7.2. <i>Immersion</i> : The IDE.....	115
7.3. Future Work.....	116
7.3.1. Information.....	116
7.3.2. Interaction.....	117
7.3.3. Collaboration.....	118
7.4. Closing Remarks.....	119
Appendix 1: Extract of Email Interview with Hildegard Westerkamp	122
Appendix 2: Extract of Email Interview with Steve Heimbecker.....	124
Appendix 3: <i>Surface</i> . Development Screenshots.....	125
Appendix 4: <i>Surface</i> . Example of PDF output function: Work Node: 'Journey'	128
Appendix 5: X3D Browsers.....	129
Appendix 6: XSLT Code Fragment Walkthrough: X3D-XSLT_Artist_Nodes.xsl.....	130
Appendix 7: <i>Immersion</i> . X3D Development Screenshots.....	132
Appendix 8: Complete List of Conference Attendances, Paper Presentations	142
Appendix 9: Complete List of Artists' Works Presented on the DVD.....	143
Bibliography.....	146

External Documentation: Electronic Technical Appendices

Technical Appendices available at <http://www.suborg.net/research.html>

Technical Appendix 1: XML Code Example: XML-NODE-Noise.xml

Technical Appendix 2: XSLT Code Fragment Walkthrough: X3D-XSLT_Artist_Nodes.xsl

Technical Appendix 3: XSLT Full Code Example: X3D-XSLT_Artist_Nodes.xsl

Technical Appendix 4: X3D Code Example: XML-NODE-Noise_output.x3d

Guide to the DVD

First Play: Short Introductory Quotes 00 mins 30 secs

Surface

Introduction	00 mins 00 secs – 08 mins 10secs
Texts, Images, Audio and Video	08 mins 11 secs – 11 mins 07 secs
Nodes and Ontological Schema	11 mins 08 secs – 14 min 03 secs
Ethics	14 mins 04 secs – 14 mins 25 secs
Genealogy 1: Artists' Timeline	14 mins 26 secs – 17 mins 21 secs
Genealogy 2: A History of Statements	17 mins 23 secs – 26 mins 29 secs
Artist_functions and Institutions in Canada	26 mins 30 secs – 31 mins 07 secs
Modifying the Dataset	31 mins 08 secs – 34 mins 20 secs

Surface Duration: 34 mins 20 secs

Immersion

Ontology & Overview	00 mins 00 secs – 05 mins 53 secs
2009: Selected Statements	05 mins 54 secs – 08 mins 11 secs
2002: Selected Statements	08 mins 12 secs – 09 mins 49 secs
1994: Selected Statements	09 mins 50 secs – 10 mins 43 secs
1984: Selected Statements	10 mins 44 secs – 11 mins 36 secs
1977: Selected Statements	11mins 36 secs – 13 mins 31 secs
Ros Bandt: Selected Statements	13 mins 32 secs – 15 mins 49 secs
Australia: Selected Artist_Functions	15 mins 50 secs – 17 mins 29 secs
Warren Burt: Selected Statements	17 mins 30 secs – 21 mins 47 secs
Radio Node: Related Artist_Functions	21 mins 48 secs – 22 mins 51 secs
Patrick McGinley: Selected Statements	22 mins 51 secs – 25 mins 03 secs
England: Selected Artist_Functions	25 mins 04 secs – 26 mins 48 secs
Katherine Norman: Selected Statements	26 mins 48 secs – 32 mins 48 secs
Female Node: Selected Artist_Functions	32 mins 49 secs – 35 mins 29 secs
Racial Node: Selected Artist_Functions	35 mins 29 secs – 36 mins 15 secs
Minor Node: Selected Artist_Functions	36 mins 16 secs – 38 mins 32 secs
Noise Node: Selected Statements	38 mins 33 secs – 40 mins 07 secs
Water Node: Selected Statements	40 mins 08 secs – 44 mins 44 secs

Immersion Duration: 44 mins 44 secs

Total DVD Duration: 79 mins 04 secs

Table of Figures

Figure 1. Scope of Present Work	1
Table 3.1. Labelle's Schema of Sound Art	41
Figure 3.4. A Genealogy of Canonical Sound Art Discourse: Lander, Kahn and Labelle.....	44
Figure 4.3a. The <i>Australian Sound Design Project</i> Homepage.....	56
Figure 4.3b. The <i>Australian Sound Design Project</i> 'Browse' page.....	57
Figure 4.3c. The Ontological Schema of the <i>ASDP</i>	59
Figure 4.4a. The <i>soundtoys.net</i> homepage.....	61
Figure 4.4b. The Tag cloud of <i>Soundtoys.net</i>	62
Figure 4.4c. <i>Tag Navigator</i> by Neil Jenkins.....	64
Figure 4.4d. <i>Soundtoys.net</i> content navigator (Adam Hoyle and Julian Baker).....	65
Figure 5.1. Command line MySQL database and Data Gathering Online.....	70
Figure 5.2a. <i>Surface</i> : Homepage.....	72
Table 3.2. Labelle's Schema of Sound Art.....	75
Figure 5.2b. The <i>ImMApp</i> Ontology of Sound Art.....	75
Figure 5.2c. Interactive Timeline	78
Figure 5.2d. <i>Soundwalking</i> presented in <i>Surface</i>	79
Figure 5.2e. <i>Co-Operative Radio</i> presented in <i>Surface</i>	80
Figure 5.2f. The <i>Canadian Arts Council</i> presented in <i>Surface</i>	81
Figure 5.3a. <i>Surface</i> : The 'Noise' Node and Luigi Russolo.....	85
Figure 5.3b. <i>Immersion</i> Process Diagram (PHP → XML → XSLT → X3D).....	85
Figure 6a. <i>Immersion</i> : Entry POV.....	90
Figure 6b. <i>Immersion</i> : Node Classes.....	91
Figure 6c. <i>Immersion</i> : 'Noise' Node.....	92
Table 6.1. Locations of Early Sound Art Exhibitions.....	95
Figure 6.2a. <i>Noise Water Meat</i> (Kahn 2001) Re-presented in <i>Immersion</i>	97
Figure 6.2b. The <i>Immersion</i> 'Water' Node.....	98
Figure 6.2c. Genealogical and Geographic distribution of Selected Statements (Water node).....	99
Figure 6.2d. Exploring the 'Water' Node in <i>Immersion</i>	101
Figure 6.3. The 'Minor' Node of <i>Immersion</i>	102
Figure 6.4. Scope of the Project (Conclusions).....	110

Appendix Figures

Appendix 3: Figure 1. Mid-2007: <i>Surface</i> prototype homepage.....	125
Appendix 3: Figure 2. June 2008: <i>Surface</i> homepage.....	125
Appendix 3: Figure 3. January 2009: <i>Surface</i> homepage showing artist-functions ordered by year of birth, a selection of nodes (left) and alphabetic ordering of artist-functions (right).....	126
Appendix 3: Figure 4. January 2009: <i>Surface</i> . Artist-functions ordered as a time-line by year of birth...126	
Appendix 3: Figure 5. January 2009: <i>Surface</i> . Luigi Russolo. Associated images (top left), nodes (top right), additional information, selected works, and audio and video files (bottom).....	127
Appendix 3: Figure 6. January 2009: <i>Surface</i> . Luigi Russolo. Data entry page.....	127
Appendix 4: <i>Surface</i> . Example of PDF output function: Work Node: 'Journey'	128
Appendix 5: Table 1. X3D browsers overview.....	129
Appendix 7: Figure 1. February 2007: <i>Immersion</i> . The earliest experiments with X3D. (<i>FluxPlayer</i> X3D Browser).....	132
Appendix 7: Figure 2. March 2007: <i>Immersion</i> An early experiment with X3D presenting images, video and showing the <i>FluxPlayer</i> X3D Browser's poor handling of text.....	132
Appendix 7: Figure 3. July 2007: <i>Immersion</i> . Early X3D visualisation of the environment. (<i>FluxPlayer</i> X3D Browser).....	133
Appendix 7: Figure 4. July 2007: <i>Immersion</i> . Artist-functions arranged geographically in movable plane geometries. (<i>FluxPlayer</i> X3D Browser).....	133
Appendix 7: Figure 5. July 2007: <i>Immersion</i> . A zoom-out from the previous view showing the absence of Asian artist-functions and an early realisation of some principle nodes (right). (<i>FluxPlayer</i> X3D Browser).....	134
Appendix 7: Figure 6. July 2007: <i>Immersion</i> . Moving back from the previous view showing an experiment with an interface to the <i>Surface</i> database. (<i>FluxPlayer</i> X3D Browser).....	134
Appendix 7: Figure 7. July 2007: <i>Immersion</i> . An early experiment showing a clustering of artist-functions around "Early Originators 1800's-1930's." (<i>FluxPlayer</i> X3D Browser).....	135
Appendix 7: Figure 8. July 2007: <i>Immersion</i> . An experiment showing artist-functions proximate to "Historical Fluxus 1959-1971." (<i>FluxPlayer</i> X3D Browser).....	135
Appendix 7: Figure 9. July 2007: <i>Immersion</i> . An experiment showing artist-functions based in London. (<i>FluxPlayer</i> X3D Browser).....	136
Appendix 7: Figure 10. July 2007: <i>Immersion</i> . An experimental audio interface based upon Harry Partch's <i>Harmonic Canon I</i> . (<i>FluxPlayer</i> X3D Browser).....	136
Appendix 7: Figure 11. November 2007: <i>Immersion</i> . A reworking of "Early Originators 1800's-1930's" as presented at the <i>Digital Archive Fever Conference</i> , Birkbeck College (<i>FluxPlayer</i> X3D Browser).....	137
Appendix 7: Figure 12. November 2007: <i>Immersion</i> . Artist-function Wassily Kandinsky as found in the above version of the environment. (<i>FluxPlayer</i> X3D Browser).....	137
Appendix 7: Figure 13. November 2007: <i>Immersion</i> . Kandinsky's geometry expanded through immersant interaction to reveal further contextual information. (<i>FluxPlayer</i> X3D Browser).....	138
Appendix 7: Figure 14. November 2007: <i>Immersion</i> . Kandinsky's selected statements revealed by further interactions with the environment. (<i>FluxPlayer</i> X3D Browser).....	138

Appendix 7: Figure 15. October 2008: *Immersion*. A generative assemblage created around selected statements from 1968 viewed from an automated camera position. (*BS-Contact X3D Browser*).....139

Appendix 7: Figure 16. October 2008: *Immersion*. Moving through the 1968 assemblage. The orange cubes representing selected statements and the polygons indicating areas of sound. (*BS-Contact X3D Browser*).....139

Appendix 7: Figure 17. December 2008: *Immersion*. A larger genealogical assemblage presenting selected statements from 2006. (*BS-Contact X3D Browser*).....140

Appendix 7: Figure 18......140

Appendix 7: Figure 19......141

Appendix 7: Figure 20......141

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Abstract

The *ImMApp* (Immersive Mapping Application) thesis addresses contemporary and historical sound art from a position informed by, on one hand, post-structural critical theory, and on the other, a practice-based exploration of contemporary digital technologies (MySQL, XML, XSLT, X3D). It proposes a critical ontological schema derived from Michel Foucault's *Archaeology of Knowledge* (1972) and applies this to pre-existing information resources dealing with sound art.

Firstly an analysis of print-based discourses (*Sound by Artists*. Lander and Lexier (1990), *Noise, Water, Meat*. Kahn (2001) and *Background Noise: Perspectives on Sound Art*. LaBelle (2006)) is carried out according to Foucauldian notions of genealogy, subject positions, the statement, institutional affordances and the productive nature of discursive formation. The discursive field (the archive) presented by these major canonical texts is then contrasted with a formulation derived from Giles Deleuze and Felix Guattari: that of a 'minor' history of sound art practices.

This is then extended by media theory (McLuhan, Kittler, Manovich) into a critique of two digital sound art resources (*The Australian Sound Design Project* (Bandt and Paine (2005) and *soundtoys.net* Stanza (1998)). The divergences between the two forms of information technologies (print vs. digital) are discussed. The means by which such digitised methodologies may enhance Foucauldian discourse analysis points onwards towards the two practice-based elements of the thesis.

Surface, the first iterative part, is a web-browser based database built on an Apache/MySQL/XML architecture. It is the most extensive mapping of sound art undertaken to date and extends the theoretical framework discussed above into the digital domain. *Immersion*, the second part, is a re-presentation of this material in an immersive digital environment, following the transformation of the source material via XSL-T into X3D. *Immersion* is a real-time, large format video, surround sound (5.1/7.1) installation and the thesis concludes with a discussion of how this outcome has articulated Foucauldian archaeological method and unframed pre-existing notions of the nature of sound art.

Keywords: sound art, critical theory, immersive environments, archive, Foucault, archaeology, genealogy, Deleuze and Guattari, digital media, database, MySQL, XML, XSL-T, X3D, minor.

Chapter 1. Introduction

“A synthesizer places all of the parameters in continuous variation, gradually making fundamentally heterogeneous elements end up turning into each other in some way” (Deleuze and Guattari 1987:121).

This quotation provides insight into the *ImMApp* research, the objective of which has been the development of a unique means of interacting with a digital archive of sound art. The quote should be understood as metaphorical and the *ImMApp* as an application of post-structural philosophy to contemporary digital practice. Theorisations established by digital arts and post-structuralist philosophy suggest innovative methods of presenting an historical study of the auditory arts. This research involves a mapping of sound art from a perspective informed by such paradigms and problematises previous treatments dependant as they are upon print media, silent pages and decontextualised listening experiences. This thesis demonstrates that immersive digital technologies offer a novel understanding of auditory practices and associated discourses by collapsing theory and practice in an open digital space which represents the divergent nature of sound art in an innovative and exploratory digital format.

1.1.2. Project Aims & Originality

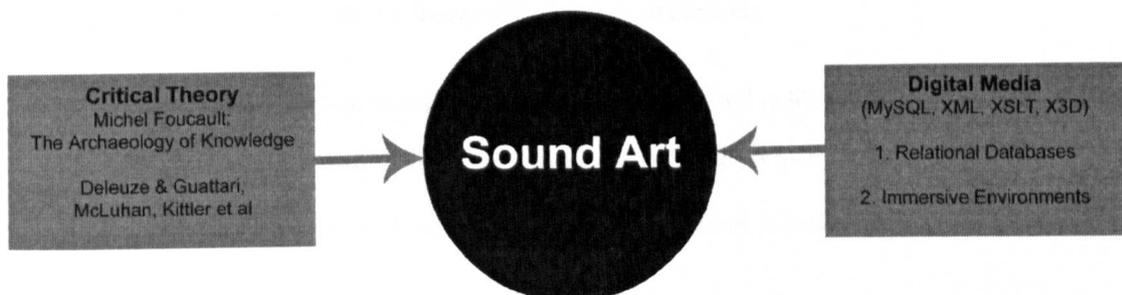


Figure 2. Scope of Present Work

My research activity has involved an extensive mapping of sound art, a focus upon the technical means of delivering the creative aspects of the work (a database application (*Surface*) and an **immersive digital environment** (IDE) (*Immersion*)), and a study of broader contemporary critical theory acting to problematise such an endeavour. The movement between these domains (post-structuralism, sound art, digital media,) has nevertheless, occurred in an integrated field of practice-based research. The use of contemporary immersive technology to conceptualise a critical ontological schema of sound art is the central

claim for originality. Additionally, the value of post-structuralist theory has been demonstrated to be directly applicable to the current field of study, and the application of such thinking to sound art is a second area where innovation is demonstrated (Figure 1.).

The explicit claims for originality made for this work are as follows:

- A novel re-formulation of historical and contemporary sound art through the development of a **critical ontological schema** derived from Michel Foucault's *Archaeology of Knowledge* (Foucault 1972). (Discussed in Chapter 2 (p14), the end of Chapter 3 (p47) and more fully in Chapter 6 (p89).
- An unprecedented **mapping** of previously dispersed sound art practices through the development of a digital archive (Discussed in Chapters 5 (p67) and 6 (p89)).
- The creation of a computer environment allowing the exploration and creative interaction with the archived material. This is the practice-based element of the thesis and is made up of two iterative parts:

ImMApp: Surface (a web browser-based database application).

ImMApp: Immersion (an immersive digital environment).

The background for these iterations is introduced in Chapters 3 (p30) and 4 (p51), and the creative practices involved in their production are discussed in Chapter 5 (p67). Research findings are addressed in Chapters 6 (p89) and 7 (Conclusions, Limitations & Future Work p112).

1.1.2. Four Scenarios

In terms of user experience and the intended context for interactions with the creative elements of the *ImMApp*, we may, as way of example, consider the following scenarios:

Scenario 1: *Surface*. An undergraduate is preparing a final project. Their definite aims are, as yet, unclear, yet they are interested in sound installation and how an artwork can relate to its presentation space. In addition to wider internet research, the results of which are found to be rather superficial, the student is given access to the *Surface* database. *Surface* provides them with a well-populated, carefully contextualised

and clearly structured account of sound art installations created over the last 40 years. Each entry is cross referenced to the specific materials, methodologies and paradigms embodied in the work, and connections to unforeseen, but proximate practices result in the student exploring the resonant characteristics of the exhibition space through a Max/MSP patch, building on the important work of such artists as Alvin Lucier, Robin Minard, Maryanne Amacher, Miller Puckette and Gordon Monahan.

Scenario 2: *Immersion*. A curator of new media in Germany is sourcing presentations and performances for a festival of new media. They are keen to explore digital technology and the way it reshapes narrative structure. The *ImMApp* proposal is accepted and a 30 minute audio-visual performance/lecture is arranged. It occurs in a large space, with panoramic video screens and a 7.1 surround sound system. The presentation re-presents a history of German sound art (*klangkunst*), and compares this with contemporaneous activity in the UK, Canada and Japan.

Scenario 3: Future Work 1 (Digital Presentation tool for Institutions). A public museum wishes to present its archive of computer art to the wider public. This material exists in a variety of fragile formats. The *ImMApp* framework is modified and a new digitised dataset collated. An interactive installation is created (large screen video, surround sound), along with an engaging and playful website, allowing the public to involve themselves with a well-curated and intuitively navigable interface to the museum's collection of rare artefacts.

Scenario 4: Future Work 2 (Creative tool for Sound Art). I receive an invitation to create an installation which is to respond to the local environment. Audio-visual material is gathered and this is rendered into a variation of the *ImMApp* database structure. In this way, the *ImMApp* offers a framework for a rapid exploration of site-specific audio-visual footage, which can then be transformed into a real-time immersive installation.

1.1.3. Thesis Overview

The components of this thesis submission are then, this document, the written aspect of the project and the accompanying DVD which presents the creative work undertaken. It is advised to view the DVD when indicated in the text. The contents of the DVD relate specifically to Chapters 5 and 6, and it will

appropriate to visit the relevant sections of the DVD when reading these chapters. This is indicated by the following icon:



Documentation of the technical aspects of the thesis is provided online as electronic Technical Appendices (<http://www.suborg.net/research.html>).

The remainder of Chapter 1 provides a short introduction to sound art and outlines a number of key concerns in the field, before framing the project's approach to digital immersion. Chapter 2 establishes the theoretical framework used in the project. This original research builds upon Foucault's conception of the **archive and discourse**, and extends his work into the area of media art analysis, used specifically in this project to problematise sound art. Later chapters deal with sound art discourse more closely: Chapter 3 focuses on three central texts, *Sound by Artists* (Lander 1990), *Noise, Water, Meat* (Kahn 2001) and *Background Noise : Perspectives on Sound Art* (LaBelle 2006), and Chapter 4 reviews two digital resources: *The Australian Sound Design Project* (Bandt 2005a) and *soundtoys.net* (Stanza 1998). Both these chapters are informed by the theoretical framework established in Chapter 2 and the application of this critical ontology to these sound art resources is innovative. We will see how the appearance of these resources is closely connected to specific **subject positions, institutions, practices and paradigms**. Chapter 4 emphasises how the media format chosen (print, website or IDE) is a key influence upon the possible range of legitimised material presented by such resources and this discussion is informed by the work of McLuhan, Manovich and Kittler¹. Chapter 5 provides an account of the creative practices undertaken during the project. It first discusses *Surface*, the database application, and subsequently, *Immersion*, the IDE. Chapter 6 provides an account of sound art from the perspective of the *ImMApp*. It is shown that this practice-based research enabled the development of an alternate view of sound art, and that creative practice has resulted in a clear questioning of dominant paradigms. This was an entirely unpredicted outcome of the project, and one supported by Giles Deleuze and Felix Guattari's notion of the 'minor' (Deleuze and Guattari 1986). Chapter 7 offers us a range of conclusions, and outlines some suggested directions for future work.

¹ My treatment of these 'canonical' media digital theorists is intended to contextualize the practice-based aspects of the thesis. A more critical position could have been adopted, most clearly in relation to Manovich, yet such an extended discussion of the issues raised by his work remain outside the scope of the present work.

1.2. Sound Art: An Introduction

“To articulate the past historically does not mean to recognise it ‘the way it really was’. It means to seize hold of a memory as it flashes up at a moment of danger...” (Walter Benjamin in Hall 2001:89).

Deleuze argues that during the post-modern era the auditory became emancipated from its traditional subservience to the visual (Deleuze 1989). This radical rupture opened a space for listening within which this research is located and Deleuze’s argument resonates with the late twentieth century upsurge in the circulation of sound art. In such work, the auditory is prioritised over the usual dominance of the visual in western art practice. Closely associated with the emergence of affordable technologies, considerations of the contextual contingences of presentation and the development of intermedial practice, the rapid proliferation of sound art from the mid-1990’s highlighted an absence of theory contextualising an apparently new form of expression.

This art of sound is not however so new. While there is a long and rich history of creative sound works, sound art as a distinct practice, came into being in the late 1960’s and early 1970’s. The term itself is attributed to Canadian artist Dan Lander sometime in the late 1980’s (Licht 2007:11). Even at this early stage, practice occupied a diverse range of sites and creative positions. An early publication in the field (Lander 1990) traces a practice simultaneously situated in serious music (John Cage, Pierre Schaefer, Karlheinz Stockhausen), installation art (Max Neuhaus, Christina Kubisch), radio work (Dan Lander, Bruce Barber), industrial music (Throbbing Gristle, Nurse with Wound), soundscape studies and acoustic ecology (R. Murray Schafer, Hildegard Westerkamp), performance art (Gordon Monahan, Stelarc), and more obscure areas such as cassette-trading networks and anti-copyright culture (John Oswald, *Negativland*).

From the mid-1990’s onwards there was a measurable increase in the circulation of sound art². This period was also marked by a lack of formal theorisation or any sustained effort in collating this diverse activity. There is no ‘archive of sound art’ as such available to researchers. Documentation remains the responsibility of artists themselves, their estates, or individual organisations. Access to this dispersed archive is therefore limited to those either involved in the work itself, or those who had the opportunity to

² *Sonic Boom: The Art of Sound*, Hayward Gallery April-June 2000 being a particularly prestigious and large-scale exhibition in the UK.

experience it as audience members. It was in recognition of this that the current project was begun and some degree of remedial action undertaken.

This period (1990's) was also characterised by the involvement of large art institutions (galleries, museums, and funding bodies) that, since this time, have continued to be important in presenting sound art to the non-specialist public. Within such domains sound art is approached from the perspective of visual art or music, yet neither of these discourses seemingly possess the vocabularies to clearly enunciate actual practice³. Carsten Nicolai, finding himself at this juncture between art, sound and music has spoken of this difficulty, "It is actually peculiar how few people who are professionally part of the art scene have a general knowledge of music" (Pesch 2002:88).

Since the late 1990's, a retrospective on artists working historically with sound has taken place, and whilst actual practice "resembles a poorly mapped geography" (W3C 2004), a number of publications have appeared in this historical vein. There is now a kernel of texts that seek to place sound art within contemporaneous cultural practices and to communicate the aims of the many artists involved. Such texts are variable in their scope and quality, yet taken together they represent the development of a major canon of sound art⁴ (territorialisation). These examples have approached their theorising and mapping from print media, or through an impoverished engagement with digital strategies, as typified by the adoption of text-based page layouts in such online resources as *UbuWeb* (Goldsmith 1996), *The Australian Sound Design Project* (Bandt 2005a) and *The Sonic Arts Research Archive* (Waters, Rogalsky et al. 2002). While these digital resources offer a broadly organised archive of sound works, their focus is not upon sound art *per se*, rather sound poetry, a nationally-determined database of public sound installations, and electroacoustic music, respectively. One of the aims of the current research is to break apart such exclusive constructions, and for the immersive environment, defined in important regards by its alterity, to articulate another minor and connective history.

³ There are exceptions however, certain galleries have a particular affiliation with soundworks. The *Galerie Rachel Haferkamp*, in Cologne, Paul Panhuysen's *Het Apollohuis*, Netherlands, Micheal J. Schumacher's *Studio 5 Beekman*, New York, and the *Singhurlorgalerie*, Berlin are some important examples.

⁴ Lander (1990), Kahn (1992), Augaitis (1994), Toop (1996), Kahn (2001), Norman (2004), Cox (2004), LaBelle (2006), Gibbs (2007), Licht (2007).

As I shall show, the *ImMApp* offers a new reading of sound art based upon more contemporary discourse, a deeper exploration of today's technology, and assesses the contribution this makes to a reinvigorated conceptualization of a marginalised art history.

1.2.1. Sound Art: Definitions, Delimitations, and Connectivities

“Question: ‘When does sound become art?’

Answer: ‘When I say so. When you say so. When a monkey says so. When Kurt Vonnegut says so. Sound is art’ ” (Simon Fisher-Turner in Young 2005).

Following the auditory turn of the 1990's, there was a measurable increase in the circulation of writing about this 'new' form of sound art. Here, we will visit a sample of different perspectives on our area of interest. Much of the literature of this time is littered with failed attempts at a definitive definition. One of the most notable is the extract reproduced above, and while a more meaningless response can hardly be imagined, it also shows the difficulties of defining such a diverse form that engages with such an ephemeral medium. Keith Townsend Obadike, one of the few Afro-American sound artists, argues that much of this confusion is generated from approaching the practice from a modernist (musical) perspective. He notes that 'sound artist' as a job description is often used by artists familiar with, if not formally schooled in, both conceptual visual practices and experimental music. This inter-disciplinary approach predates the appearance of 'sound artist' as a distinct form. He argues that the term's value within the black visual tradition enables him to align his work "equally with visual and performance artists, composers and sound designers" (Townsend Obadike 2001). He argues that the modernist (musical) bias evident in much of the literature is of no relevance to his practice, nor to that of many other contemporary sound artists. Paul Miller (*D.J. Spooky*) continues the theme in an on-line interview (Miller 2002). His work, highly theorised and dealing with themes of Afro-modernity, finds inspiration in Deleuze and Guattari, and identifies them as emblematic of a certain kind of thinker who sought a line of flight from the impasse of material dialectics, committed themselves to a globalised reality and engaged with non-Western philosophies. This statement evokes the most influential practitioner of 'an art of sound' who clearly occupied a proximate position, politically and aesthetically, to this modernist modality: the ubiquitous John Cage.

Cage's legacy is explored more in Chapter 3, but it will be useful at this time to enter into a short discussion of the implications of Cage's ideas upon historical and contemporary sound art:

“When Cage expressed that the emancipation of music required the use of all sounds as a resource for composition, he unfortunately was also establishing a precedent for the exploitation of ‘sound’ as a decontextualised commodity that could be defined, and manipulated by a set of cultural codes” (Dunn 2001:3).

Francisco Lopez argues that Cage's ideas derived from the compositional challenges he faced as a student of Schönberg during an important period of study in California. While Cage developed strategies to evade the procedural formalities of serialism, he never managed to escape the formalist concerns established by this ultra-rationalist practice (Lopez 1996:1). The key problematic in discussing Cage and his contemporaries is their musicalisation of all sound, and their doctrine of a discontinuous novelty coupled with a loyalty to ‘music’ that remained absolute. The view of the time, that ‘anything can be music’ resonates with the quote at the beginning of this section that reiterates such a position in regard to sound art (“Sound is Art when I, or a monkey, says so”). It is perhaps because of this perceived relation of sound art to art music that conceptual confusion continues to this present time.

Such is the danger in the development of canons, whose existence limits the scope of, in Foucauldian terms, the sayable and visible in discourse, and these terms are explored extensively in Chapter 2. All we need note here, is the possibility that the sustained propagation of the importance of Cage may serve to actually limit the scope of subsequent developments in an art of sound. Rather than the over-worn reiteration of the significance of Cage's 4'33" for example, there are, as I will demonstrate, a multitude of alternative avenues to explore.

Max Neuhaus wrote critically in 2005 about the circulation of the term sound art; he makes a clear distinction between new musics, following the filial line of Cage, and the possibility of the emergence of new art forms:

“Aesthetic experience lies in the area of fine distinctions, not the destruction of distinctions for promotion of activities with their lowest common denominator, in this case sound... [T]here are, of course, an infinite

number of possibilities to cultivate the vast potential of this medium in ways that go beyond the limits of music and, in fact, to develop new art forms. When this becomes a reality, though, we will have to invent new words for them. ‘Sound Art’ has been consumed” (Neuhaus in Young 2005:74).

An understanding of the critical problematisations of the field can be enriched through the provocative proposals made by Henry Flynt in the early 1960’s, when the first generation of American artists following Cage attempted to respond to his legacy.

Flynt, self-proclaimed anti-art activist of the American avant-garde, understood the potential implications of both the empirically-derived electronic music being explored by Karlheinz Stockhausen in the Cologne studios of *Westdeutscher Rundfunk* (WDR), and the high conceptual formulations residing above Cage’s proclaimed plane of immanence. For Flynt, the important differentiation was not between music (intended sound) and noise/silence (unintended sound), but rather on an alternate axis running between structure and material. Flynt generated the term **structure art** to describe creative practices whose main focus was upon conceptual cleverness (Flynt 1961), and related this to the ultra-rationality of serialism (and by extension Stockhausen) and the conceptual play of Cagean-influenced practice, where musical word scores were soon to evolve into proto-Fluxus event scores. Flynt’s primary interests were mathematics and logic, and within these domains was the growing understanding that their abstracted formalisms could not sustain any claims towards truth as a final referent. Flynt simply applied this awareness to the arts. In this way, he conceived of a new configuration of creative forms, in which structure, or later, concept was only one of many others. The categories he also proposed include *linart* (linguistic art, to replace poetry), *visart* (to replace painting and sculpture), and, importantly for our purposes, *audart*, intended to replace music. For Flynt, audart was to provide a way of “*Enjoying a Non-Controlled Acoustical Environment*” (Flynt 1961:2) and the refinement of this into a distinct practice.

Flynt proposed an activity based in the individual’s phenomenological experience of sound where the internal activity of the listener’s consciousness is of equal importance as the external auditory stimuli. His ideas not only resonate with the post-structuralist mantra of the death of the author/composer (enabling the birth of the reader/ listener) but also relate to an anecdote from much later in the development of sound art. Brian Eno often recounts how, being bed-ridden during a long period of convalescence, he would

experiment with the playback volume of the music he listened to, reducing the volume so the sounds of the radio would merge with the non-controlled sounds of his environment. This, he says, was important in his subsequent development of ambient music.

Flynt's ideas also highlight a mode of listening clearly 'unmusical' in its intention, a modality more based upon material contingency than of emotional manipulation and evocations of transcendental entities. An understanding of such a perceptual modality is useful in approaching the works of many sound artists. Notable among such practitioners are Bernhard Leitner, Ed Osborn, Maryanne Amacher, Robin Minard, Achim Wollsheid and the young Swiss duo, Pe Lang & Zimoun, although there are a great number of others whose work can be fruitfully understood from a Flyntian position.

Douglas Kahn, a key theorist, is particularly critical of the circulation of the term 'sound art' during the 1980's as its popularity clearly originated in metropolitan art centres, in "their markets, institutions and discourses" (Kahn 2006:1). He draws attention the work being done throughout the 1970's and 1980's in locations distant from the market-orientated cosmopolitan centres. He cites ten or more high profile sound exhibitions from the late 1970's and early 1980's which have remained obscured in the recent theorising of a perceived new art-form. For example, *Sound* at the Los Angeles Institute of Contemporary Art in 1979 and *Für Augen und Ohren* at the Akademie der Künste in Berlin in 1980⁵. Kahn traces a growing conservatism in music throughout the 1980's, and argues that artists interested in experimental sound resorted to using the word 'art', "because it was more capacious, discursively and institutionally, than music" and the term 'art' was valued for its ability to be "generalized beyond the fine arts, visual arts and the so-called art-world" (ibid:2). For Kahn, the key theme in discourse is a musicalisation of sound as suggested by Lander (Lander 1990). This theme was not intended to deracinate sound art practice from music, but rather to operate as a means to identify a particular technical and discursive approach to the artistic use of sound.

David Dunn, sound artist, ecologist and theorist, asks what new sound-making activity may mean, if the intention is not music-making in the traditional sense. He states that the purpose of his creative activity is, "to recontextualise the perception of sound as it pertains to a necessary epistemological shift in the human relationship to our physical environment" (Dunn 2001:3). Though coloured by his ecological

⁵ There were a number of other contemporaneous exhibitions omitted by Kahn. For example, *Sound Sculpture*, Vancouver Art Gallery, 1975, *Sehen um zu Horen*, Stadtische Kunsthalle, Dusseldorf, 1975, *Soundings*, State University of New York, 1981.

concerns, Dunn's formulation provides a useful insight into a meta-thematic strand running throughout his work over a period of more than 30 years.

1.3. Digital Immersion: An Introduction

"Rather than approaching the medium as a means of escape...I see it as a means of return, i.e. of facilitating a temporary release from our habitual perceptions...to enable us, however momentarily, to perceive...the world around us freshly" (Davies 2004)

Several writers have emphasised the historical precedents for immersive digital environments (IDE's) and they highlight the arbitrary nature of the distinction between 'old media' and 'new media'. Their observations refer back to antiquity when a multi-sensory immersive ritual experience predated any written mediation of the transcendental. The effectiveness of immersive experiences in creating and maintaining illusion can be seen throughout history with regard to religious architectures (either natural or man-made), royal palaces, circuses, theatres, cinemas, multimedia performances, and of particular relevance to the current project, art installations.

Grau provides an historical overview of immersive environments and emphasizes the practice's close correlation to human psychology, while underplaying the significance of the digital (Grau 1999). The examples he cites indicate the long heritage of immersive environments whose potent spaces, without exception, support the dominant power relations of the era in which they are produced⁶. The close connection between immersive illusions and centralised political power cannot be overstated.

In a pre-digital art historical sense, Grau cites a diverse body of works ranging from the Wagnerian *Gesamkunstwerk*, to Monet's Impressionist panorama of water-lilies, Prampolini's futuristic theatre concepts, and Eisenstein's theories about multi-sensory 3D cinema. To this might be added examples from sound art: Avraamov's *Symphony of Factory Sirens* (USSR 1923), Fluxus Happenings, multi-channel electro-acoustic diffusion concerts, soundwalks, the potential list is without end. Suffice to say that the

⁶ Including the Villa Itern at Pompeii (60BC), the Sala delle Prospettive in the Villa Farnesina, Rome (1516-1518) and the Guards' Room of Holyrood Palace, Edinburgh (1787).

immersive environment did not simply appear with digital technology; rather it has a long and rich heritage throughout human history.

Although immersive environments date back to antiquity, their current, digital incarnation is closely tied to cyber culture and notions of the 'virtual', and as such is discussed by such theorists as Gibson (Gibson 1988), Nechvatal (Nechvatal 1999), Diamond (Diamond 2002) and Morie (Morie 2003; Morie 2005). Generic types of the contemporary IDE are computer games, simulations, entertainment environments and art installations, although a sense of 'being immersed' can include a broader range of experiences. Ryan considers digital immersivity from the perspective of literature, and provides the following account of the effects of immersion from the writings of de Cervantes:

"He so immersed himself in those romances that he spent whole days and nights over this books; and thus with little sleeping and much reading, his brains dried up to such a degree that he lost the use of his reason"

(de Cervantes Saavedra 1605 in Ryan 2001).

Such is the general view upon immersion, commonly held to remove any form of critical consciousness. So involved, so absorbed does the 'immersant' (Davies 2003) become in the flow of information, whether from a text or an environment, that distanced, critical filtering disappears. It is however, possible to think about this differently, whereby the immersive experience represents a line of flight away from a linear and ocularised rationality towards a spherical embodied and experiential structuring of experience. The latter modality clearly connects to many aspects of sound art and this connection between IDE's and sound is articulated by Char Davies, one of the earliest artists to work in IDE's:

"...sound has an ontology that challenges the solid world. Sound, like soft vision, also returns us to what I have come to call the 'presence of the present'" (Davies 2004).

Such a view resonates with the discourses of Eno and Flynt as discussed earlier. The earlier quote from Davies (p11) relating immersive technologies to their ability to recontextualise experience, not only echoes David Dunn's comments regarding his view of sound art, but also to the formulations of VR theorist Joseph Nechvatal who, in an important essay on the subject, emphasises the ability of IDE's to "unframe some regulating functions of consciousness" (Nechvatal 2009:24). Nechvatal recognises that IDE's do not

only involve the modification of virtual environments, but also the “substantial ability of the immersant to self-modify his or her sense of self” (ibid). It was with these considerations in mind that the *ImMApp* project was undertaken; original research into the way in which an IDE might unframe pre-existing notions of sound art generated from print-based media, and an exploration of how digital immersion, sharing some important characteristics with the practices occurring in the field of study, could create a connective body of spatialised virtual objects existing in an infinite digital space. Rather than approaching sound art as populated by distinct and stable units, my approach was to investigate the connections and co-modulations of between these elements existing in a finite and regulated discursive field of real-world social practices.

A final point that needs to be made is that my goal was never one of simulation; the *ImMApp* does not recreate sound installations in a retrospective reconstruction of reality. VR was to be used as a conceptual space modelled upon nothing in the real-world. Emphasis was upon the possibilities introduced above: for the potential for IDE’s to unframe and to rupture normative structures in the hope this would allow alternate perspectives to emerge.

This chapter has introduced the *ImMApp* project, provided an overview of sound art and demonstrated that it is an unstable locus of debate and should be considered polyvalent. The digital technologies used in this research operate upon a plane distinct from print-based methods. The project has been shaped by a symbiosis between digital technology and the culture-space of a minor art practice. The objective of the work is to create an immersive digital assemblage combining elements of database design, real-time 3D and multi-channel audio with the intention that this will contribute to a reinvigorating discussion of the main research areas: sound art, practice-based digital immersion and post-structural cultural theory. The first two areas are discussed in Chapters 3 to 6, we will now in Chapter 2 explore the latter, and learn how Foucault’s historical method has informed the project.

Chapter 2. Theoretical Framework: Foucault's Historical Method

“By way of a preface let us say that on none of the matters to be discussed do we affirm that things are just as we say they are; rather, we report descriptively on each item according to how it appears to us at the time.” (Sextus Empiricus 1994)

“Let's do ontologies the proper way, based on strong mathematical principles.” (Carlson 2008)

The *ImMApp* project has been consistently informed by two parallel theoretical paradigms. On one hand, a sceptical, descriptive and critical historical method informed by post-structural critical theory (Foucault), and on the other, a practico-aesthetic paradigm (Guattari 1995) influenced by conceptual and material developments in computing. It is important to understand that while the two domains are distinct, the project has depended upon an ongoing oscillation from one domain to the other. The two have been treated separately for the purposes of the written thesis; the latter of these is discussed in Chapters 5 and 6 while the current chapter outlines the aspects of the work informed by post-structural considerations. Key thinkers who have been particularly important are Michel Foucault (discussed in this chapter), and Giles Deleuze and Felix Guattari (discussed in the concluding section of Chapter 3 (p47)).

Chapter 1 noted that while sound art has become more evident as a creative practice, there is an absence of a critical toolset for the interpretation of sound art material. We need only consider the maturation of interpretative methods for visual material to make evident the relatively impoverished frameworks evident in sound art. As we shall see in Chapter 3, certain key texts fail to engage with broader cultural/critical discourses, their major contribution being a territorialisation of sound art via the canonisation of certain important individuals. While there is value in such efforts, they remain problematic and isolated from the advanced methods evident in visual culture. A key objective of the *ImMApp* was to explore how a practice-led research project would be able to generate an innovative view of sound art. It was necessary to develop a critical language to inform the project's creative aspects, and the proximate area of visual culture was selected as a rich source for this critical vocabulary.

Visual culture is populated by a rich ecology of disparate approaches closely connected to broader philosophical, social and political discourses. We might note the breadth and depth of material generated

from compositional interpretation, semiology, gender studies, content analysis, audience studies, anthropology, and discourse analysis (Rose 2006). Such was the rather expansive scope of the *ImMApp* project, that just one of these possibilities, Foucauldian discourse analysis, was selected as the primary theoretical tool for this research, though this analysis was constantly framed by the more diffuse theorisations of Deleuze and Guattari.

2.1. Why Foucault?

Foucault's work on the **archive** ((Foucault 1972), (Foucault 1974)), his problematisation of authorship, (Lander, Kahn and LaBelle depend upon an unproblematised treatment of 'artists'), and his historical accounts of certain discourses (madness (1961), medicine (1963), science (1974) and sexuality (1976, 1984a, 1984b)) suggested his work as a productive starting point. We will now explore how aspects of Foucault's work have been used in the *ImMApp* with the intention of justifying this choice.

2.1.1. The Archive

Foucault uses this term in a specific way. When using the word, he is referring to the array of all possible **statements** made at a given historical time within a particular discourse. A methodology derived from Foucault needs to address this notion, and apply two further concepts, **archaeology** and **genealogy** to this series of statements. Each of these is dealt with in the writing that follows, as well as a detailed discussion of some key Foucauldian concepts and their relation to sound art.

Rose, in discussing visual culture, suggests that Foucault's work on the archive has resulted in the development of two distinct but related methodologies, **Discourse Analysis I** (Rose 2006:141) and **Discourse Analysis II** (ibid:172). It will be useful to understand this distinction, as this opens up how this aspect of Foucauldian methodology is used in the *ImMApp* project. While she is unambiguous that such distinctions are often in practice not so clear, Rose also notes the significant difference in the types of research produced by the two approaches. To apply her models to the auditory domain, one might say that **Discourse Analysis I** works with auditory images, written texts and recorded/diffused sonic material, and tends towards focussing on "the production and rhetorical organisation of [sonic] and textual material" (Rose 2006:172). In contrast to this, **Discourse Analysis II**, while using similar materials, is "much more concerned with their production by, and the reiteration of, particular institutions and their practices" (Rose 2006:172). Rose cites two researchers working in each of these milieus to illustrate the implications of the

respective strategies. Tonkiss applies the term archive specifically to the data collected during the research process, which is then used as the basis for later analysis (Tonkiss 1998). Sekula on the other hand, examines the institutional nature of the archive itself, arguing that archives are not neutral, that demarcations of inclusion/exclusion are important and that archives affect both what is contained within them, and those who use them (Sekula 1989). Both of these approaches were useful in structuring the *ImMApp*. Firstly, in a manner derived from Sekula, a descriptive analysis of the three texts later discussed in Chapter 3 was undertaken. It was thought that these texts, understood as key elements in the institutional archiving of sound art, could be critically addressed from the understanding that as regulative statements (McNay 1994), they were neither neutral, or inert, but historically determined and that Foucauldian analysis would unpack some of their **theoretico-active aspects**⁷ (Foucault 1989:2).

Having decided upon this course of action, a second strategy was devised, based in the model proposed by Tonkiss. Alongside the critical reading of the archive as explained above, there would be a process of gathering data from more dispersed sites and the creation of the project's own archive (a digital database), with an evaluation of how this material might inform a critical appraisal of sound art from this alternate perspective. Chapters 5 (p67), 6 (p89) and 7 (p112) discuss this aspect of the *ImMApp*.

2.1.2. The Study of Surfaces

A second motivation for using Foucault is his non-interpretive, non-anthropological investigative strategy. Foucauldian method is typified by a sceptical treatment of ahistorical political claims and deals purely with a descriptive account of "regularities, differences, appearances and surfaces" (Kendall 1999). Foucault stresses the need to "make a simple historical compilation", claiming that all meaning is evident upon the surface of such an assemblage. This knits with Sekula's treatment of the archive, where what is visible, and what is not, is considered an appropriate area of analysis. Further to this, such a strategy, as non-anthropological, emphasises the primacy of the statement over that of the author. This inversion is provocative to a discourse where, as we shall see later, the perceived primacy of the author/artist is seldom challenged.

⁷ McNay (1994) emphasizes this Foucauldian neologism, a modification of Satre's notion of the 'practico-inert', in understanding the productive nature of discursive formation. Satre introduced his term in *Critique de la Raison Dialectique* (1960) when, amongst other things he was re-assessing his involvement with the French Communist Party. He refers the term to a field of collective activity that has become unresponsive to the group's needs. Bureaucracy is the classic example of 'practico-inert'. Foucault turns this concept around, and is instead interested in how organisations may not only be unresponsive, but active in producing discourse which may be contrary to the interests of the individuals involved in the collective activity.

Such a method focuses then upon systems of dispersion, and the discontinuities between objects, forms, concepts and paradigms are vital in understanding discursive statements. An emphasis upon this divergence seemed relevant to the aims of mapping sound art. Where other researchers have attempted to construct chains of inference (meta-narratives), the *ImMApp* would instead focus on the ruptures between disparate practices with the aim of disarticulating an increasingly reified view of the field.

The majority of sound discourse continues to function around the circulation of certain entities, their status being supported by the reiteration of second order judgments, and we will see evidence of this in Chapters 3 and 4. When an entity gains status from the authority of another investigation, ahistorical political claims are in danger of being imported into the analysis, and Foucault makes it clear that this should be avoided. Such considerations resonate with the productive nature of the archive as discussed above, and Foucault's recommendation of the suspension of second order judgments was important in informing the construction of the *ImMApp* archive. Firstly, the evident nature of these second order judgments and their role in the theoretico-active production of sound art was used to populate certain areas of the dataset. Secondly, Foucault also seemed to encourage an antagonistic process, based in the creation of the alternate *ImMApp* archive, and while this only became apparent quite late in the project, the development of a minor history of sound art was generated by these insights (see Chapter sections 3.5 (p47) and 6.3 (p102)).

Before discussing archaeology and genealogy more fully, we need to clarify what is meant by the particularly Foucauldian notion of discourse, because, as we shall see, Foucault established a particular understanding of the term and it is central to the *ImMApp* project. Defining this will aid us greatly in revealing the unitary discursive field with which we are engaged, and point towards a means of analysing the statements made within this field.

2.2. Foucault: Key Terms & Their Relation to Sound Art

This section provides an overview of some key terms proposed by Foucault, and an explanation of how they have been used in the *ImMApp*. I begin by introducing **discourse**, and suggest how this can define the limits of sound art. The chapter continues with the introduction of **archaeology**, **the statement**, and **genealogy** before outlining my extrapolation of these concepts for the purposes of this research. The chapter

ends with a proposed schema derived from the previous discussion, and indicates how such a schema contributed to the formulation of a minor history of sound art, as informed by Giles Deleuze and Felix Guattari.⁸

2.2.1. Discourse

Foucault wrote a great deal about his evolving ideas of discourse. Whilst at times being contradictory, there are some aspects of the term that are clear. For Foucault, discourses are productive, they are 'at work' producing aspects of life, and their productive nature (i.e. their production of subjectivities) codifies both internal processes within subjects, and their interactions with external entities (human and non-human). In fact, for Foucault, there is no inside (in thought), nor any outside (in things). He stresses that discourse does not only involve language (also being evident in procedures, apparatuses, techniques, materials and so on) and that thought is not a private mental procedure, but the result of the operation of public apparatuses. Our use of words is not governed by the familiar notion of reference (referring to something 'out there'), but it is the use of words that determines the properties of external objects, and that such use is determined by the operation of discourse. In proposing this, Foucault is trying to fragment reference into domains of reference, which are established by the particular forms of regulation and types of statements that organise the diverse spaces in which particular objects can appear. We can draw out some further aspects relevant to the *ImMApp* project, and from these, sketch out some preliminary methodological implications.

- Discourses delimit the sayable while providing the spaces (concepts, metaphors, analogies) for the appearance of new statements. We need to identify the rules that delimit the sayable within sound art.
- Every discourse is the result of a practice of production which is material, discursive, specific and in relation to other practices of discourse. We need to identify the rules that ensure sound art is both material and discursive.
- Discourses are not closed systems, innovation is always possible. However, some discursive formations behave as closed. We need to identify the rules that create spaces in which new statements can be made.

⁸ The concept of the 'minor' is discussed in the concluding section of Chapter 3 (p47).

What is emphasised here is the newness and novelty of statements, and how they create new forms of subjectivity and new modes for understanding practices. This prioritises the operation of public apparatuses (research centres, universities, technological networks, galleries and festivals) over the inner, secret working of some individualised great thinking. It could be argued, although it would be overstating the point, that the entire history of sound art is based upon notions of innovation, yet, we should attempt to disarticulate these claims by fracturing them into sets of specific practices and thoughts (called by Bruno Latour ‘networks’ (Latour 1987)).

- Discourse is regulated and systematic. The rules of discursive formation are not simply internal to discourse but also include rules of combination with other discourses and rules that establish difference from other discourses. We need to recognise sound art discourse as a corpus of statements which are organised regularly and systematically.

Discourse is a key term in Foucault’s lexicon, this clarification of the term is vital for the *ImMApp* project. Foucault devised techniques for historical enquiry informed by the notion of discourse; these have been influential during the research process, and we will move the discussion on to these.

2.2.2. Archaeology

“Archaeology [...] simply indicates a possible line of attack for the analysis [...]: the specification of a level – that of the statement and the archive; the determination and illumination of a domain – the enunciative regularities, the positivities [and] the application of such concepts as rules for formation, archaeological derivation, and historical a priori” (Foucault 1972:227).

Simply put, an archaeology of knowledge takes snapshots of the archive at particular instants and provides a description of what is found (McNay 1994). Foucault’s method is profoundly non-interpretive; there is no search for deeper meanings. All meaning is evident upon the surfaces found, in the interplay between subjectivities, institutions and discourse and the archive itself, and the method is purely descriptive (Rabinow 1984). Analysis of statements in the archive involves reconstructions of the material conditions of historical knowledge, and Foucauldian archaeology describes discourses as practices specified in these

elements of the archive. Further to this, the archaeological method explores the networks of what is said (statements), and what can be seen (visibilities), and explores how these mutually condition each other.⁹

2.2.3. The Statement

In addressing the statement, Foucault is concerned with the diverse forms occurring within a discursive field, and asks what necessities link these statements together, and why these and no other. For our purposes, the analysis of the 'sound art statement' has focused upon artworks¹⁰. For Foucault, statements and such necessities are clearly related to particular times and places, and statements are always, of course, made by a subject. Both subjectivities and statements are understood to be historically determined, and in an attempt to trace the relation between subjectivities and statements, Foucault poses a series of questions:

- 1) Who is speaking? We could ask who has the right to call themselves a sound artist and who is qualified to do so? Who gains status from this position, and who gives the artist the affirmation that their position is valid?
- 2) Where are they speaking from? Where does sound art obtain its legitimacy, from where do sound artists make their discourse and what are its points of application?
- 3) What are their possible positions in relation to the domains and objects of sound art discourse? What delimits the perceptual field that defines relevant information? What modifies this field, what are the positions occupied in the relevant information networks, and what determines these networks?

In these questions Foucault is concerned with the **subject of discourse** and proposes that an emphasis upon non-human agents allows a researcher to step back from an unduly formalistic interpretive approach to statements and recasts the enquiry from a purely descriptive position. Such a methodology allows us to "describe the anonymous dispersion of concepts through texts, books and oeuvres." (Foucault 1972:67)

⁹ Foucault himself used the archeological method in a number of works (including Foucault 1970, 1973) and it has been used to varying degrees of success by a number of others. For example, (Scheurich 2002) and (Geiger 2008)

¹⁰ Although other material has also been reviewed, including artist statements, proposals, reviews, academic articles, criticism and academic analysis, public email forums, websites, CDs and records, films and DVDs, as well as more ephemeral conversations, telephone interviews and my own subjective experiences.

Having clarified the identity of the **statement**, we are now someway closer to defining a Foucauldian-derived method for analysing sound art. We will now turn to his notion of **genealogy** and explain how this concept is used in the *ImMApp* project.

2.2.4. Genealogy as Comparative Archaeology

“Genealogy is grey, meticulous, and patiently documentary. It operates on a field of entangled and confused parchments, on documents that have been scratched over and recopied many times.”

(Foucault in Rabinow 1984:76)

As we have seen, Foucault’s archaeological method involves historical moments in the archive (**epistèmes**). Genealogy is a deepening of this and explores such epistèmic changes over time. Genealogy attends to the processual aspects of the web of discourse, its ongoing and changing nature. Whereas archaeology studies a historical moment, genealogy addresses historical change.

This aspect of Foucault’s work again emphasises the productive and theoretico-active nature of the archive. The study of the changing contents of the archive over time is intended to reveal the relation of the statement to power as an active and ongoing process occurring in the ‘history of the present’. In this way the contingent nature of the historically occurring statement is highlighted, and while the genealogical method retains Foucault’s non-interpretive perspective, it is intended to flush out the “disreputable origins and unpalatable functions” (Rose 1984) of specific discourses. For Foucault, the genealogical method assists in theorising the nature of the (re)production of knowledge and power relations which are for him of primary importance. Such productive activity is, he argues, the function of the archive and genealogy serves to articulate this with relation to discursive formations¹¹.

¹¹ The recognition that the archive is not just an abstract entity simply documenting the past was explored by Foucault in his work with the Group d’Information sur les Prisons (GIP) where he, and others (including Felix Guattari), demonstrated the political value of the archive in resisting dominant discourse. Foucault’s own archival work, to which he maintained a commitment throughout his working life, often resulted in the use of unexpected, non-dominant sources. A fine example of this is Foucault’s 1975 study of 19th century parricide (Foucault 1975), where his meticulous use of disparate archive material articulates the roots of contemporary notions of madness, justice and medicine.

2.2.5. Foucault: Weaknesses of the Method

Let us recap: this chapter began providing a justification for the choice of Foucault in providing the central theoretical basis for the *ImMApp* project; the two aspects of his work of particular significance being his work on the archive and his non-interpretive study of surfaces. After exploring his formulation of the archive and providing two alternative applications of his ideas (Tonkiss (**Discourse Analysis I**) and Sekula (**Discourse Analysis II**)), we then moved to a deeper exploration of his notions of discourse, archaeology, the statement and genealogy.

Before providing a more concrete schema for the application of Foucault's ideas to sound art, we must however, acknowledge the weaknesses of such a methodology. Foucault's critics are numerous and attack his work from a variety of perspectives. Mills summarises the main thrust of such objections (Mills 2003):

- Foucault's disinterested stance, combined with his lack of political analysis mean, especially for Leftist historians, that his work is deeply problematic.
- Foucault also fails to engage with issues of gender, as much of his work is focused upon male subjects. While this means his work can be faulted from a feminist position, it has not precluded his work being developed by theorists working in this domain.
- His location of resistance within power itself is understood by some to underplay the agency of those opposing oppressive regimes, and this focus upon power can lead to repetitive treatments of material, if "all cultural phenomena are reduced to power relations" (Mills 2003:123).
- While **Discourse Analysis I** pays close attention to statements themselves, being effective in exploring the field of intertextuality in which such statements occur, issues of reflexivity can be subsumed. In order to address this, let me state that the context for the production of the *ImMApp* is of paramount importance. To reiterate the sceptical position introduced at the beginning of this chapter, any claims made towards the authority of this analysis (the *ImMApp*) need to be tempered by a clear acknowledgement of the researcher's own subjective positioning.

Rose identifies some further difficulties (Rose 2006:169):

- **Discourse Analysis I** sets out a research practice which seeks material from as broad a range of sources as possible. However, in exploring intertextual connectivity, when should this process stop and how can such connections be empirically grounded and connected to social practice? This observation is pertinent to the practical aspects of the *ImMApp* project, and such difficulties are addressed in Chapters 5 and 6.
- A second objection to **Discourse Analysis I** is also connected to Foucault's neglect of the social practices of discourse. That his non-interpretive model focuses upon when and how statements appear, rather than why they do so, means that it can be criticised for failing to ascribe causality between discourses and their historical contexts. Such a method, focussed upon statements, engages less with the "social institutions that produced, archived, displayed, or sold them, and the effects of those practices" (Rose 2006:170). Such a failure can however, be tempered by the use of **Discourse Analysis II** which seeks to directly engage with such issues.
- Conversely, critical assessments of **Discourse Analysis II**, while highlighting its strengths in engaging with the role of institutions in the production of statements, also point towards its relative inattention to statements themselves. It is also weak in its typical treatment of reflexivity, nor is it able to deal with the specific means of engagement invited by a statement, or the divergent nature of the knowledges differentially brought to such sites of reception.

The *ImMApp* project combines these two strands of Foucauldian method (**Discourse Analysis I** and **Discourse Analysis II**). Such a methodology in the context of the *ImMApp* is further modulated by the use of technology, the importance of which is as significant as the Foucauldian considerations outlined in this chapter and is discussed in Chapter 4.

We have now put in place a framework for using Foucault's ideas and this will now be linked to a proposed schema of sound art. The consequent model is not intended as a definitive categorisation of sound art statements, but merely a means of mapping the ruptures and silences between diverse and changing activity. We are aiming to cut through the normative groupings evident within discourse as illustrated by the three texts analysed in Chapter 3.

2.3. Proposed Schema

An exploratory ontological schema has been devised to structure the underlying data architecture of the database and Foucault's ideas have been central in shaping this aspect of the work. The categories described here were derived from a close reading of *The Archaeology of Knowledge* (Foucault 1972). The focus of the *ImMApp* project has not been to ascribe value to the internal consistency of a particular artwork (**statement**), or to attempt to ascertain the unspoken, unconscious aim of an artist (**subject**), or indeed to attempt any form of interpretation. The objective has been in identifying the rules that govern the appearance of a work at a given time and to locate the linkages of that work to other statements within the discursive field.

In a manner informed by the Foucauldian vocabulary discussed previously (2.1–2.2), I arrived at an array of **node classes** used to characterise the dataset. These classes appear below and a short overview of each is subsequently provided. Please note that no hierarchical priority is implied in this list, rather that the interplay between the nodes contained within these classes is presented as constitutive of the discursive field (see 5.2.3 Cross Referencing: Nodes p74).

Concepts	Practices
Themes	Paradigms/Forms of Specification
Subject Positions	Techniques
Institutions and Apparatuses	Materials
Surfaces of Emergence	Canons
Strategies	

2.3.1. Concepts

A number of core concepts (units of knowledge) run through discourse (e.g. noise, sound installation, soundscapes) and, following Deleuze and Guattari, such concepts are always **signed** (Deleuze and Guattari 1996): the authors of such concepts can be traced and are commonly cited (Russolo, Neuhaus, Schafer). However, one has to acknowledge subsequent ideas, some of which are derived from the earlier ones, but many will be heterogeneous and even incompatible with the original formulation. We should not seek a coherence of concepts, but rather their successive or simultaneous appearance, the distance that

separates them, and even their incompatibility (Foucault 1972:38). Our focus is then on the interplay of their appearance and dispersion.

2.3.2. Themes

The distinction between a concept and a theme occurs at the point of a concept's "successive appearance" and its "subsequent dispersion". A concept (signed) is always attributed to an author and associated with a specific epistèmic moment. Once subsequently taken up by others, (whose treatment of the concept may be heterogeneous with the initial formulation) it is transmuted into a theme. However, we should not attempt to establish a permanent definition of these, but rather explore the distances between their successive differential treatments (**genealogy**), as these points of choice, the dispersion of these points, and their potentially opposed strategies reflect the nature of the changing discursive field in which these games are played.

2.3.3. Subject Positions

From a Foucauldian perspective, the subject is defined by a group of relations undergoing a constant state of renewal, and the ongoing establishment of these is effected by discourse. The 'sound artist' should not be considered a regulating subject, rationalising differentiated elements and domains into a coherent conception of a monolithic object called 'a sound art practice', but rather that the discontinuity of the various planes manifest a subjective dispersion. Sound art discourse should not be seen as the external expression of a given synthesising consciousness, but a space of exteriority dispersing the subject within a regulated totality.

In accordance with this, and Foucault's more general depreciation of the subject, the terminology of **artist-function**, rather than 'artist' is used throughout the remainder of the *ImMApp* project. Alongside the artist-function, discourse is also populated by such functions as curatorial, critical, theorising, academic, and, as we shall see, the more problematic constructions of race, gender and sexuality.

2.3.4. Institutions and Apparatuses

Much sound art is associated with institutions that simultaneously support and limit what is legitimately possible to say. Not everyone is authorised to speak and what might be said is in fact highly

restricted. Specific types of institution relevant to the *ImMApp* project are museums, galleries, radio stations, funding bodies, universities, state agencies and specialist groups in civil society (e.g. *The Sonic Arts Network* in U.K.). Apparatuses are used by subjectivities and institutions in order to disperse their statements: for our purposes we consider exhibitions, festivals, symposiums, conferences and the relation of these to specific functions on one hand (artists, curators, critics and so on), and institutions, on the other.

2.3.5. Surfaces of Emergence

A particular sound artwork (**statement**) may lead to variety of different locations (public spaces, software environments, the natural world, online) where such statements appear. The specifics of this, that is to say, the context of its production, as well as its relation to the means of subsequent distribution and consumption are a further aspect of the proposed ontology.

2.3.6. Strategies

An obscure essay found in *Sound by Artists* (Lander 1990) illuminates three strategies utilised by artist-functions to ensure circulation of their work (i.e. their appearance within the archive). A short discussion opens out these rather restricted options. Bruce Barber, writing between 1988 and 1991, identifies three market models of distribution:

- **Hollywood Model.** Artist-functions following this route emulate models established by major capitalist institutions and address the conditions of “the so-called free market” (Lander 1990:131).
- **High Culture Model.** With aspirations to the first option, those working with this strategy produce work conforming to the tastes of a specialist and informed elite. While this market constituency may be relatively small compared to the mass market of the Hollywood Model, it is of significant and growing proportions.
- **Underground Model.** This third option is characterized by an extremely small market and a relatively closed system of production. In many ways it mirrors and has developed from such precedents as independent record labels, tape distribution networks, short-run print publishers and alternative radio broadcasts. Here we might include those coming from a punk/ post-punk/ industrial heritage, free improvisation (Bailey 1980), radio art (Kahn 1992), (Augaitis 1994), (Jensen 2006), noise music (Hegarty 2007) and web-based audio art (Föllmer 2005).

To these, we might also add what might be called the Public and Institutional Models:

- **Public Model.** The strategy is marked by artist-functions working with public agencies (state representatives, local councils, civil society) and creating populist work accessible to the general public¹².
- **Institutional Model.** A number of artist-functions are connected to specific institutions. These may be academic in nature (e.g. *Simon Fraser University*), and/or organised along the lines of a research institute (e.g. *IRCAM*, *WDR*). Those working in the electro-acoustic and soundscape traditions are commonly found embedded within such organisations. These affiliations are desirable for a combination of factors:
 - a) Prohibitive Cost of Technological Audio Art for individual artists.¹³
 - b) Issues of Reception.
 - c) Political Legitimation.

Clearly these are not exclusive categories, and many artist-functions move from one to another at different points in time.

2.3.7. Practices

As I discussed above, discourse analysis can be criticised for its potential failure to connect discourse to social practice. Hence it has been important in the *ImMApp* project to establish such connections and to forge an initial framework addressing these concerns. Specific practices found within sound art include circuit bending, soundwalks, performance and plunderphonics.

2.3.8. Paradigms / Forms of Specification

Sound art does not exist in a discursive vacuum. It exists in the wider field of all discourse. The linkages between sound art and broader paradigmatic forms of specification (e.g. theatre, Fluxus, acousmatics, psychoacoustics, film, dance, and radio) are important in locating the discursive limits of sound art itself.

¹² One of the case studies (*The Australian Sound Design Project*) discussed in Chapter 4 is entirely committed to such practice.

¹³ At least in a historical sense technological determinism (i.e. the availability of relatively cheap products for the recording, organisation, and diffusion of sound) is a commonly occurring explanation for the increased activity in sound art.

2.3.9. Techniques

Statements embody specific techniques and amongst these, certain possibilities will be available at particular times and places, while others will be unavailable. From all available techniques, why is one selected and not another? How are these learned and how are they used differently? We may include collage, synthesis, performance, narrative, recording techniques, multichannel diffusion strategies and such like.

2.3.10. Materials

In sound art, we encounter a range of materials employed. Does the fact that two separate artist-functions use piano wire indicate any meaningful connection between their respective statements? Do two artists who use vinyl records share some common field of reference? Under this grouping we may include such materials as specific computer software, found objects, particular instrumentations, sampled material, particular sources of recorded material and so on.

2.3.11. Canons

Foucault considers the formation of canonical texts as taking a theoretico-active role in discursive formation; how the establishment of major statements and texts operates to delimit, and simultaneously to provide the resources for, the appearance of legitimate statements in discourse. It is to a review of three such canons that we will turn to in the following chapter.

We should also note that the distinctions between a number of these classes are not clear cut, and certain nodes appear simultaneously in two or more classes. 'Noise' for example may be considered a **concept** (signed by Russolo (Russolo 1916)), yet to limit its appearance exclusively to this class would be to deny its appearance in a number of other forms. Noise can also be considered a **theme** (many artists throughout the period under study have been inspired by Russolo, but also significantly departed from his original formulation), a **technique** (used by a variety of artist-functions, for a variety of reasons, in a variety of creative forms), and clearly since the popularisation of Noise Music, it has potentially surpassed **paradigmatic** status. (Attali 1985), (Ilic 1994), (Cranfield 2002), (Elecktra 2005) and (Hegarty 2007).

2.4. Foucault: Summing Up

This chapter has explained the relevance of Foucault to the *ImMApp*. We have visited a proposed ontological schema derived from his theoretical basis and also understood the weaknesses of such a methodology. This critical framing of sound art is an original formulation and it may appear conspicuous within the thesis format that this original research has been introduced before the scholarly reviews of sound art and digital media presented in Chapters 3 and 4, respectively. The objective in working in this sequence is to allow this alternate position (derived from Foucault) to inform the analysis of these twin territories. The results of this have been folded into the design of the creative aspects of the *ImMApp* and the successful outcome of this approach is discussed in Chapter 6.

We will now embark on a journey through some existing elements of the archive, and these reviews have been valuably supported by the theoretical framework introduced above. The selected elements fall into two categories. Chapter 3 explores three canonical texts, *Sound by Artists* (Lander 1990), *Noise, Water, Meat: A History of Sound in the Arts* (Kahn 2001) and *Background Noise: Perspectives on Sound Art* (LaBelle 2006). Chapter 4 contrasts these with two digital resources (*Australian Sound Design Project* (Bandt 2005a) and *Soundtoys.net* (Stanza 1998)) which offer us an alternate view of the wider archive of sound art within the contemporary post-digital context. This combined review of print-based and digitally-based sound art discourse parallels the evolutionary methodology of the *ImMApp*. The project began with a review of print-based material: Foucauldian critical theory and sound art from the perspectives of Lander, Kahn and LaBelle. Subsequently this critical theory was applied to, and these perspectives contrasted with, the two digital resources. An assessment of the relative strengths and weaknesses of each approach (print vs. digital) was made, and the conclusions reached iteratively and creatively deconstructed into the practical elements of the thesis: the database application *Surface* (discussed in Chapter sections 5.2 (p71) and 7.1 (p114) and documented in the first section of the DVD) and finally the immersive digital environment *Immersion* (discussed in sections 5.3 (p83) and 7.2 (p115), and demonstrated in the second section of the DVD).

Chapter 3. Sound Art: A Review of Print-based Discourse

“At its most basic the very act of writing about sound is an act of translation. Translation of an idea from one language to another is a difficult enough process, but to transcribe, recreate or describe the quality of a sound, or a delicate mix of sounds, poses a larger problem”(Micah Lexier in Lander 1990:9).

In the preceding chapter, we established a schema for a Foucauldian-derived methodology to inform a critical analysis of sound art. While those aspects informed by **Discourse Analysis I** (Tonkiss) are explored in Chapters 4 (p51) and 5 (p67), here we will be focussing on **Discourse Analysis II** (Sekula), namely a study of the institutional influence in the theoretico-active production of the archive. The texts addressed in this chapter (*Sound by Artists* (Lander 1990), *Noise Water Meat: A History of Sound in the Arts* (Kahn 2001), *Background Noise: Perspectives on Sound Art* (LaBelle 2006), and the digital resources covered in Chapter 4 were selected for their importance (canonical positions) within contemporary discourse and hence their influence upon actual practice. While other texts have been investigated¹⁴, the three texts discussed in this chapter were also chosen for their potential to articulate several aspects of the critical ontology introduced in Chapter 2:

- Each statement occurred at a specific time; as such they can be regarded as the historical snapshots suggested by Foucault’s notion of **archaeology** and their distribution through time offer a **genealogy** of sound art discourse between 1990 (Lander) and 2006 (LaBelle).
- By focusing upon statements with shared characteristics (book and online formats) certain differences can be highlighted. One area illuminated is that of the various **subject positions** represented by these articulations.
- Each of the statements has clear relationships to specific **institutions, apparatuses and surfaces of emergence**.

¹⁴ Including: exhibition catalogues ((Duttman and Eckhardt (1980), Delahanty (1980)), books ((Erlmann 2004), (Blesser 2007), (Drobnick 2004), (Gibbs 2007)), artist publications ((Heimbecker 2005), (Wilson 2005), (Wollscheid 2001), (Kubisch 2000)) and journal articles ((Andersen 1986), (Augaitis 1994), (Bandt 1985), (Banks 2000), (Baschet 1987), (Behrendt 2006) and (Cascone 2006).

The analysis of each text has been approached from a different Foucauldian perspective. In the discussion of LaBelle, the analysis focuses upon **paradigms** and discusses the text's presentation of three possible **forms of specification**. With Kahn, the book is used to articulate **subject positions and themes**, while the first of the texts, *Sound by Artists* is used as the basis for a discussion of the role of **institutions** with regard to sound art and the primacy afforded by this text to **artist-functions** within the context of Canada in the early 1990's.

The discussion of *Sound by Artists* and its relation to various institutions is further augmented by material generated in a series of email interviews with three Canadian artists who were working at the time of the book's publication. This original research serves to provide an initial glimpse of the kind of counter-archive that has been created in the course of the *ImMApp* project. While dominant positions are propagated by the type of officially sanctioned discursive formation of which *Sound by Artists* (and the other reviewed resources) are examples, non-dominant, less territorialized (minor) practices will tend to be silenced. As these interviews show, despite the best intentions of authors to acknowledge artists working with sound, the production of many artists remains unmapped. It is in order to demonstrate this that a chapter nominally addressing print-based discourses revisits the previously undocumented historical context of the book through the individual voices of involved practitioners, speaking retrospectively through the contemporary, flattened digital medium of email.

3.1. *Sound by Artists*: 1990: Artist-Functions & Institutions

Sound by Artists is an anthology of forty short sections. It was the earliest of the canonical texts to appear and focuses upon the specifics of *a* sound art (albeit cast in terms of a poly-medium). Some indication of the book's canonical status is provided by the number of secondary sources citing the text ((Reitzenstein 1991), (England 1993), (Duguid 1998), (Cox 2003), (Dyson 2004), (LaBelle 2005b) and (Jensen 2006)).

Dan Lander's role in the early propagation of sound art is noted by Licht (Licht 2007:11) and this was confirmed by Canadian sound artist Gordon Monahan in a telephone interview conducted by myself in April 2008. Monahan, whose *Speaker Swinging* project (1982) features in *Sound by Artists*, is well placed to provide a retrospective discussion of the book's appearance and the types of social practices and discourses

that surrounded it. For Monahan, the book's premise, that a clearly delimited form of creative practice, 'sound art' existed, is problematic. While agreeing that there were a range of artworks using sound in the years leading up to the book's publication, Monahan questioned the validity of grouping such diverse practices together. Monahan recounted that Lander was very active in proposing such a territorialisation, and like Licht (Licht 2007) attributed the authorship of the term to the same, singular subjectivity. However, we should remain sceptical about such claims which focus purely upon the agency of a single individual. Foucault would consider the productive role of institutions in the historical appearance of statements and depreciate the role of individuals. The value of such a method can be demonstrated by a line of enquiry undertaken in problematising *Sound by Artists*, an enquiry framed by Foucault, and based in a series of email interviews with two further Canadian practitioners.

I was concerned at this time with what *Sound by Artists* did not say, and did not render visible. I was treating the book as an important element in the historical archive of sound art and was interested in discovering to what extent institutional involvement facilitated discursive formation (**Discourse Analysis II**). Conversely, I was also interested in how such involvement inhibited, or restricted the range of legitimate statements. An unforeseen outcome of these exchanges was the realisation that digital communications technologies (email) provided a restructuring of the possible interactions between artist-functions and researchers/academics. The interactions facilitated/limited by my chosen research method enabled me to explore a distant epistème of sound art in a modality different to that offered by the isolated and one-way interaction usually experienced when reading a book-as-text. The type of exchange resulting from such a method is illustrated below by an extract from the email interview between myself and Westerkamp¹⁵:

TAYLOR: *Can you tell me something about the context of sound art in Canada at the time of the book's publication?*

WESTERKAMP: From my perspective of someone who was mostly focusing on soundscape and acoustic ecology at that time, as well as radio broadcasting, I became aware of sound art mostly through broadcasting. We were working with people on *Vancouver Co-operative Radio*, who like me, were interested in broadcast experiments, i.e. considering radio as an artistic medium, which was a rather new concept over here then. So in a way those were the beginnings of what is often called radio art."

¹⁵ Please refer to the larger extract of this interview reproduced in Appendix 1: p122)

This first exchange with soundscape/radio artist Hildegard Westerkamp offers a lucid reconstruction of the material historical conditions of *Sound by Artists* appearance. It is clear from this that Lander's individual role in the formation of sound art in Canada should be located within a broader local, national and international context.

Several of the points raised in this exchange should be emphasised:

In contradiction to Lander, who, at least for Gordon Monahan, was proposing a visual art-form that used sound, Westerkamp's opening remarks point unambiguously to the importance of radio in introducing her to sound art, and radio, is of course, a profoundly non-visual medium. This divergence in the **forms of specification** between Monahan and Westerkamp, open up the problematics of a final delimitation of sound art.

Hildegard Westerkamp also suggests the importance of various institutions in Canada in the circulation of a discourse of sound art. Firstly, in considering radio, the *Vancouver Co-Op Radio* station can be understood as a **surface of emergence**, responsible for the generation of a new vocabulary for broadcast art, and alternatively, the emergence of college radio stations able to broadcast more exploratory programming, as significant additional sites for the literal transmission of sound art.

In relation to the importance of institutions, I should also draw out the role of the *Canada Arts Council*, which by the 1980's provided funding specifically for audio art. The purpose of such funding is explained clearly by Westerkamp, "Canadian identity, distinguishing our culture from US mass media culture, finding our own cultural 'language' and some pride in it." That funding was also available for the *Canadian Electroacoustic Community* seems to have facilitated, during conferences and festivals, inter-subjective exchanges which, we can postulate, were important, not only for the intended purposes, but also for the formation of sound art within the Canadian context of this period.

Some of the ruptures between distinct artist-functions are also evident. On one side, Westerkamp with an explicit ecological agenda based in attentive listening to the natural environment, and on the other, electroacoustic composers. The uncomfortable nature of the institutional genre categorisation (audio art) is further expressed by the second correspondence with Canadian intermedia and audio artist, Steve

Heimbecker who is very definite about the divisions between practitioners. A fuller extract from this interview can be found in Appendix 2 (p124).

This second interview illustrates the ruptures evident between produced subject positions (**artist-functions**) as expressed by Heimbecker's atomised creative practice and the problematic validation of such activity once taken up by institutional agents. While the publication of *Sound by Artists* validated the art-form ("See, I'm not crazy"), and provided resources for its further circulation, it also delimited the possibilities of legitimate practice and discourse. Lander takes pains in his introduction to note (in a passage addressing John Cage) that "the useful limitations that constitute and enrich a musical art practice, restrain and limit an art of sound" (Lander 1990:11). However, this framing, on one side by Western art music (John Cage, Alvin Lucier, Richard Kostelanetz), and the other by fine arts (Bill Viola, Christina Kubisch, Max Neuhaus, Stelarc) actually restrict the possibilities of sound art. This is acutely felt by such artists as Heimbecker, whose musical background is not in elitist art music, and whose art practice is not, perhaps, so 'fine'.¹⁶

We can continue this discussion of the relationship between institutions and sound art by using the Foucauldian approach to culture, which conceives of such an analysis not as a study of meaning, but as a study of management (Kendall 1999:139). Rather than an unpicking of the texts found within its covers, I will now turn to two further institutions whose activities were vital to the volume's existence, the book's two co-publishers, *Art Metropole* and the *Walter Phillips Gallery*.

3.1.1. 'Sound by Artists': Associated Institutions

Art Metropole, an artist-run gallery, archive and distribution agency was founded in the context of post-1968 activism. A left-wing activist/artists' collective, *General Idea*, was behind the formation of the organisation. Their work, sampling popular culture, drew heavily from queer politics and an anti-museum aesthetic. From the mid-1970's onwards, *Art Metropole* had been involved with the Canadian conceptual art movement, publishing books, (*Performance by Artists* (1977) being the first), promoting video art and curating exhibitions. In 1997 it transferred its entire collection to the *National Gallery of Canada*. *Art*

¹⁶ This comment is not intended pejoratively, but indicates a form of specification of art practice not based in legitimised art forms but in more exploratory artistic practices. This theme, and the issues raised by the Heimbecker interview are further explored in Chapter section 3.5. (p45) where the notion of the minor is discussed at some length.

Metropole then embodies sound art's connectivity to conceptual art, video art and art publishing. For all the anti-museum posturing of *General Idea*, the transfer of their collection opens up a discussion of a meta-theme found around sound art, that is to say, its appropriation by quasi-nationalist agendas. This is illustrated by a discussion of *Sound by Artists* co-publisher, the *Walter Phillips Gallery*. This institution, known for its support for emergent art forms since 1976, like *Art Metropole* is also associated with video art and performance art alongside its presentation of sound works, (e.g. *House Fire* (2001) by Janet Cardiff and George Bures Miller). The gallery, operating under the jurisdiction of the *Visual Arts Department of the Banff Centre* counts among its sponsors *Canadian Heritage*, *Canada Council for the Arts* and the *Alberta Foundation for the Arts*. Further evidence of this nationalistic agenda can be quickly demonstrated in a survey of Canadian Heritage's portfolio which also includes the *Canadian Broadcasting Corporation*, *Library and Archives Canada*, the *National Battlefields Commission*, *Status of Women Canada* and a significant number of other agencies.

3.1.2. *Sound by Artists: Analysis*

- The book seeks to establish sound art as a distinct social practice, problematically bounded by art music and fine art, with an overall emphasis upon North American activity.
- While the **influence of institutions** is mentioned obliquely, the editors of the book, in their selection and organisation, afford primacy to the **artist-function**. The book is used, for the purposes of the *ImMApp* project, as an **archaeological** snapshot of Canadian discourse from 1990.
- It embodies the significant institutional activity which supported Canadian audio art at the time. *Sound by Artists* is presented here as a well-distributed productive element of the archive, simultaneously limiting the future appearance of legitimised statements within the archive, while also providing the resources for this to happen.

A review of the time notes that, "...this book is an inherited framework rather than one which comfortably describes a definite area of artistic practice." (England 1993) and we should note that the "inherited framework" is not purely determined by framing sound art by music and visual art, but perhaps more importantly by the concerns and agendas of the organisations behind the book's appearance. This book was the sixth in the *Art Metropole* series ... *by Artists*, and this was important in defining the overall nature of the statements considered legitimate. Previous topics covered in this series were Video art (two volumes),

Museums, Performance Art and Books, and while the connectivity of sound art to these practices has been made apparent in the course of the *ImMApp* research, the exclusion of such artists as Steve Heimbecker points to the problematics of such distanced and disinterested institutional influence. Such difficulties emerged in the course of the *ImMApp* research and were important in the generation of the 'minor' grouping in the *ImMApp* dataset. Heimbecker's experiences have been taken as emblematic of those artists excluded from major discourse, and this outcome of the *ImMApp* research is discussed in Chapter sections 3.5 (p47) and 6.3 (p102).

3.2. *Noise Water Meat: 2001: Themes & Subject Positions*

This work from 2001 by Douglas Kahn was published by the MIT press. Kahn studied composition with Alvin Lucier and Ron Kuivila, has professional affiliations with music, art history and media art university departments and is an Editorial Board Member of the influential *Leonardo Music Journal*.

Of particular interest in *Noise Water Meat* is the organisation of the material. Treating sound art from a Western avant-garde perspective, Kahn organises his writing around three main themes (Noise, Water, Meat), which he argues, construct a productive entryway into the role of sound in modernism. A sceptical description of shared thematic concerns running through apparently divergent social practice has been explored extensively in the *ImMApp* project and is directly derived from the ontological schema introduced in Chapter 2. Hence, *Noise Water Meat* is treated here from a purely descriptive position. We are interested in the study of surfaces, and interpretation of the text is non-admissible from a Foucauldian perspective. What we are seeking to achieve is a distanced and critical mapping of the discursive field embodied in this particular statement found within the archive of sound art and to relate this to the specifics of Kahn's subjective positioning.

3.2.1. *Noise: Dada, Futurism, Synaesthesia, Recorded Sound & John Cage.*

Kahn begins in the late 19th century with evocations of Lautrémont's *Les Chants de Maldoror* (1868) before framing the use of noise in modernist art. Kahn then turns to a short review of synaesthesia, before dealing with recorded sound, where Edison's phonograph begins a discussion of technology's effect upon the cultural experience and understanding of sound. Kahn then dedicates an extended section of the book to John Cage, a figure entirely pervasive throughout the three canonical texts. As acknowledged by

Kahn: "...the great aesthetic net of Cage proved to be both a safety net over which daredevil experimental feats could be attempted and also an obstacle preventing individuals from grounding themselves in something beyond-Cage" (Kahn 2001:225).

Kahn suggests that this difficulty in progressing beyond Cage was profoundly influential to the generation of artists directly following him¹⁷. Kahn ends *Noise* with a review of this generation with particular emphasis upon the *Theatre of Eternal Music*¹⁸.

3.2.2. *Water: Pollock, Fluxus, Intermedia*

Water provides "a short art history of water sound" lapping around Cagean territory, by looking back to its use in the work of composers Satie, Wagner, Cowell, Le Caine and Takemitsu, and artists Schwitters, Roussel, Huxley, Duchamp and Pollock. Kahn argues that though not a final break with early modernist practice, the introduction of Pollock's frenzied dripping and Cage's *Water Music* (1952) are indicative of a cultural shift: "a disciplinary dissolution that would come to signal a greater saturated and fluid state within the late-modernist arts" (Kahn 2001:244). Kahn traces the integration of previously disparate artistic forms and the blurring of the borders between them and life to Cage's Experimental Music Classes of 1958 and 1960. Kahn touches on a majority view of the 'fateful individuals' involved with the East Coast avant-garde (Henry Flynt for example is not mentioned), and seems to make an unsupportable ahistorical, ageographical claim on the origins of such intermedia¹⁹ practice on the behalf of such subjectivities.²⁰

This, with a few passing remarks on Yoko Ono, Andy Warhol, Carolee Schneemann and Meiko Shiomi, ends Kahn's analysis of water with the last reference to a water-based art-work being Annea Lockwood's *A Sound Map of the Hudson River* (1982).

¹⁷ Allan Kaprow, Al Hansen, George Maciunas, Dick Higgins, Yoko Ono, Nam June Paik, George Brecht and Alison Knowles.

¹⁸ Namely Lamonte Young, Tony Conrad, John Cale, Angus MacLise and Marian Zazeela.

¹⁹ Kahn incorrectly attributes the authorship of the notion of 'intermedia' to Dick Higgins. In fact the term was coined by Samuel Taylor Coleridge in about 1810 (Frank P. (1982)) and revitalized by Higgins at a time when such could become less a speculative vision and more an executable practice.

²⁰ The *ImMApp* database, in comparison, also includes European activity (Jean Tinguely, Iannis Xenakis, Takis, Karlheinz Stockhausen, Francois & Bernard Baschet), Japanese (Yasunao Tone, Group Ongaku), as well as American examples which are exterior to Kahn's discourse (Max Matthews, Pauline Oliveros, Percy Grainger and Harry Partch)

3.2.3. *Meat: Burroughs, Artaud and McClure, but No Escaping Cage*

The final section, *Meat*, focuses upon the body and the voice through the work of William Burroughs, Antonin Artaud, and Michael McClure. The central position given to Burroughs by Kahn is intended to demonstrate sound art's connection to literature, and in an extension of its methods in the electric then digital eras, its emplacement in experimental broadcast practice. Rather than exploring this vital area however, Kahn embarks on a protracted chapter on the philosophies of L. Ron Hubbard, Wilhelm Reich and Alfred Korzybski and its relevance to the actualities of sound art practice is marginal. Kahn's treatment of Artaud focuses upon the Frenchman's influence upon the American musical avant-garde of the 1950's and 1960's, and he returns to the Pollock-Cage axis explored earlier. As regards McClure, Kahn's treatment illuminates little of contemporary practice and the book ends with a discussion of modernist psychological practice, even less relevant to his supposed theme.

3.2.4. *Noise Water Meat: Analysis*

Noise Water Meat treats modernist sound from Kahn's elevated position, with American practice, and Cage more specifically, colouring his writing.

The chapter *Noise* provides a cross-disciplinary reading of early sound practice, over-determined by the factors mentioned above. *Water* has much to contribute within the national and historic framing of American modernism, but in its brevity, reveals the idiosyncratic choice of theme and has significant omissions. *Meat*, says the least, and in Kahn's play of obscure references and conceptual teasings of all the voices recorded, it is his own that sounds most loudly.

Kahn acknowledges the significant absence of female or non-white artists and justifies his selection as inclusive of those who "have held the attention of many contemporary artists working with sound" (Kahn 2001). While the influence of Cage et al is undoubtedly felt by many contemporary sound artists, Kahn is keen to point to lesser cited, but potentially equally rewarding sources for a review of sound art. However, he fails to deliver upon this, as all the cited artist-functions are firmly fixed within a modernist Cagean paradigm.

Through Kahn's political affiliations, which ensure the circulation of his statement and its serious treatment, he is able to construct an overt performance of an imagined history, legitimising the values of the associated institution (*MIT*), while implicitly silencing otherness. His book, while suggesting a possible post-modern approach to a historical reading of sound art, also demonstrates the dangers of such a method. His thematic focus claims to open out discourse to positions defined by alterity, yet his final outcome is over-determined by such thematic structuring which is rendered impotent by his deeper aesthetic, political and social affiliations.

3.2.5. Kahn & Lander: Comparisons

We have touched on a few comparisons between Kahn and Lander (the difference in agendas of their respective publishers), yet there a few more points raised by their intertextual relation.

Firstly, it is notable that Lander provides a 'simple historical compilation', an anthology of writing collated from a number of other sources. His voice is present, but presented as one of many. Kahn, published five years later, engages on another level entirely, and attempts a more oblique strategy. While Lander 'just lets sounds be', Kahn works on them, finding deeper meanings and providing retrospective linkages between functions. This can be understood as a maturation of sound art discourse occurring over a relatively short time-span (1990-2001). So for Lander, his sources, defined by historical contingency, were all primary, whereas for Kahn, the primary sources, while evident, have become less important than his own analysis.

Secondly, the deepening of a critical language as provided by Kahn has the effect of limiting the breadth of his selection of statements. So while Lander includes a broad sample (53 artist-functions), Kahn discusses just over half that number. While simple totals are no indication of value, this demonstrates the type of historical contingency identified by Foucault as important in discursive formation. We may ask what the effect might be of a critical language developing on the basis of an exclusive selection of artist-functions, and the subsequent circulation of such 'advanced' formulations. We must also note that while *Noise Water Meat* is currently available in paperback in the UK, *Sound by Artists* is long out of print.

3.3 *Background Noise*: 2006: Paradigms & Forms of Specification

Continuum, publishers of *Background Noise*, the most recent of the texts to appear, was established by a corporate merger in 1999. The organisation specialises in a broad range of disciplines but have a strong academic focus upon the humanities, and this is evident in LaBelle's style and method. LaBelle himself is "an artist and writer working with sounds, places, bodies, and cultural frictions" (LaBelle 2007). He is also an academic, and *Background Noise* is the result of PhD research completed at the London Consortium.

3.3.1. *Statements, Artist-Functions and Paradigms: Micro, Meso and Macro*

The book shows a form of self reflexivity, it opens with a short section *Fade In* and ends with *Fade Out*. This structural play clarifies the further maturation of discourse. Unlike Lander, who uses the fine grain of specific **artist-functions**, and unlike Kahn, who discusses shared **thematic concerns**, LaBelle's study functions at the **paradigmatic level**. Yet, these paradigms ("perspectives") are articulated, not by specific **artist-functions**, although many are discussed, but rather by specific **statements**. By doing this LaBelle traverses a number of levels of analysis engaging at the micro-level, with the specificities of particular artworks (**statements**), at the meso-level with social practices and subjectivities (**artist-functions**), and at the macro-level of **paradigms**.

Table 3.1 (p41) offers a deconstruction of *Background Noise*, one facilitated by the practice-based methodology of the *ImMApp* research. It clarifies LaBelle's historical narrative, and highlights how his approach connects conceptions of paradigmatic clusters (Dada, Fluxus, minimalism, acoustic ecology) to specific statements (*4' 33"*, *Box with the Sound of Its Own Making*, *Soundmarks*), made by particular artist-functions (John Cage, Robert Morris, Hildegard Westerkamp) at epistemic intervals (1952, 1961, 1977). As with Lander and Kahn, North American activity enjoys a position of privilege, as does European practice, with Japanese activity also discussed in some detail. LaBelle begins with Cage and contrasts the composer's work with European (*musique concrète* and *Electronische Musik*) and Japanese movements (experimental sound improvisation). He casts this discussion in terms of difference, with America claiming the conceptual ground, Europe the technological and scientific, and the Orient presenting a physical expressivity of sound performance.

Paradigm	Statement	Year	Artist-Function
Origins, dada, musique concrète	<i>4' 33"</i>	1952	John Cage, Pierre Schaeffer, Karlheinz Stockhausen, Group Ongaku
Happenings, Fluxus, Minimalism, Concept Art	<i>Box with the Sound of Its Own Making</i>	1961	Robert Morris, La Monte Young, Michael Asher
The Voice, Performance Art	<i>I am Sitting in a Room</i>	1970	Alvin Lucier, Vito Acconci, Christof Migone
Site-Specific Sound, Architecture	<i>Public Supply</i>	1966	Max Neuhaus, Maryanne Amacher, Bernhard Leitner, Iannis Xenakis
Acoustic Ecology, Sound Installation	<i>Soundmarks</i>	1977	R. Murray Schafer, Hildegard Westerkamp, Yasunao Tone, Bill Fontana
Interpersonal and Network Space	<i>Global String</i>	2002	Atau Tanaka, Achim Wollscheid, Apo33

Table 3.3. LaBelle's Schema of Sound Art

This descriptive analysis of *Background Noise* also opens up the various forms of specification validated in the interaction between LaBelle, his perceptual field, and the institutions enabling/limiting the form of his statement's appearance in the historical archive of sound art. To clarify the significance of this, we may ask how such a history would appear differently if approached from an alternate paradigmatic position. That is to ask, what alternate narrative would appear if such a project was informed by, for example, the type of specialist sound-based activities described by Blesser (Blesser 2007), namely acoustic design, psychoacoustics, sound engineering, sound for film, synthesis and audio product design?

3.3.2. LaBelle's Forms of Specification

In contrast to an imagined history of sound art informed by the engineering paradigm of Blesser, LaBelle's version, based in the humanities, argues that the key concern of sound art is the relational aspect of sound to social and spatial interactions. This is located alongside the general site-specific art practices produced during the 1960's, and the next section of the book traces such developments through Happenings, Fluxus, Minimalism, installation and concept art. The latter two of these, claims LaBelle, reflect the broader shift from modernism to postmodernism occurring in the period. LaBelle views this change as shaped by issues of immediacy and immanence, as shown in the work of La Monte Young, Robert Morris and Michael Asher. LaBelle's targeting of these artist-functions is important; by using examples of these artists' works, LaBelle offers us further insight into the forms of specification operating within his paradigmatic framing

of the discursive field. In approaching these artworks he suggests that each of these artist-functions uses sound in a different way, which he suggests can be understood from three distinct positions:

- **Phenomenological.** La Monte Young
- **Relational.** Robert Morris
- **Conceptual.** Michael Asher

We may note several points regarding LaBelle's identification of these three forms of specification:

- This is clearly an elitist discourse, one informed by philosophical and critical concepts originating in the institutional structures of the university, museum and art gallery. Young undertook post-graduate courses at the University of California in the late 1950's and subsequently studied under Stockhausen, and later, Richard Maxfield. Morris obtained a M.A. in 1966 from Hunter College, New York (writing on Constantin Brancusi), and Asher has long been entrenched within elitist discourse: it is from this positioning that the significance of his work is generated.
- The institutional critiques provided by such artist-functions as Asher, while inward-looking, have an important role in the productive nature of art-making as social practice. While the discursive, as outlined by LaBelle, is evident in many sound art-works' expression of phenomenological space and the specifics of context, what LaBelle calls the conceptual (Asher) has been retrenched in recent, populist, presentations of sound art. As an example of this, we can mention the *Sonic Arts Network Expo Plymouth 2007*, billed as "a free and fun...sonic circus" (Sonic Arts Network 2007).
- A third point is that of audience reception. We can see how the nervous systems, and critical faculties of the subjectivities of the audience, became a focus for artists working with sound almost 50 years ago (Young, Morris and Asher). However, neither the expert performance of Kahn, nor the interpretive criticism of LaBelle, is able to hear any voice originating from the other side of the artwork. Subject positions are created by particular statements, and specific ways of listening are invited by a sound work, individual responses will vary, and this differential is a consideration in a significant number of sound artworks. There are divergences in the nature of the knowledges brought to the surfaces of emergence associated with sound art (galleries, museums, public spaces),

not only between members of the public, but between them, the artist-functions, and the institutional apparatus.

- Finally we can see how the forms of specification brought into play by LaBelle delimit the range of possible statements that may be considered legitimate. In this case, a treatment based in the arts/humanities excludes a potential alternate history based in the 'dry' sciences and the apparently lesser valued practice of 'sound design'. This type of silenced distinction (art vs. design), and the total exclusion of statements being made in the latter mode of production is anachronistic in the contemporary context, highlighting the paradigmatic, institutional, social and historical biases shared by Lander, Kahn and LaBelle.

3.3.3. *Background Noise: Analysis*

Of the three canonical texts, LaBelle uses the most developed analytical framework to structure his discourse. This we can correlate to his subject position as a young academic, producing a body of work for his doctorate, and the subsequent recasting of his research into a form acceptable to Continuum, his publishers. While the work is effective in moving between different realms of analysis, addressing notions of subjectivities (**artist-functions**), artworks (**statements**), systems of understanding (**forms of specification**) and **paradigms**, each of these are subservient to a sense of historical progress. The major weakness is this untenable sense of teleological development. LaBelle's narrative begins from a point of auditory origin, for him within and between bodies, and, as time unfolds, artistic auditory practice becomes increasingly dematerialised, finally residing within the digital networks. This is an over-determination of historical sound art, which, if one were to identify any single trend, would be towards an increased diversity of practices, informed by an expanded array of discourses. LaBelle would have been well-advised to heed the words of one of his doctoral supervisors, Allen S. Weiss, who, in writing about radiophony and sound art opens an article with:

“Multiple and contradictory histories of radiophony could be constituted, depending upon both the historical paradigms chosen to guide the research, and the theoretical phantasms behind the investigation.”

(Weiss 1996:9)

This is as relevant to sound art as it is to radiophony, and paraphrasing a later review of an anthology of radio and sound art edited by Weiss, we might say, “there is no single entity that constitutes

sound art but rather a multitude of sound arts” (Weiss 2001:2). LaBelle’s work marks a territorialisation of sound art, executed while an agent of dominant discourse. He extends Kahn’s earlier work to include more contemporary material and covers a greater range of geographies, yet the mapping is over-coded by the contingencies of the historical context of the book’s appearance. The scope of the work is delimited by, on one hand, the demands of print-media, both in a pragmatic sense (the act of writing) and an institutional one (the text being derived from a doctoral thesis, and reformatted according to the needs of academic-commercial publishing), and on the other hand, by the historical and theoretical ‘phantasms’ used to guide the research.

3.4. Chapter 3: Conclusions

The historical appearance and the subsequent circulation of these canonical texts (amongst others) takes a theoretico-active role in discursive formation. The establishment of central statements operates to simultaneously delimit yet also provide the resources for the subsequent insertion of institutionally legitimised statements into the archive.

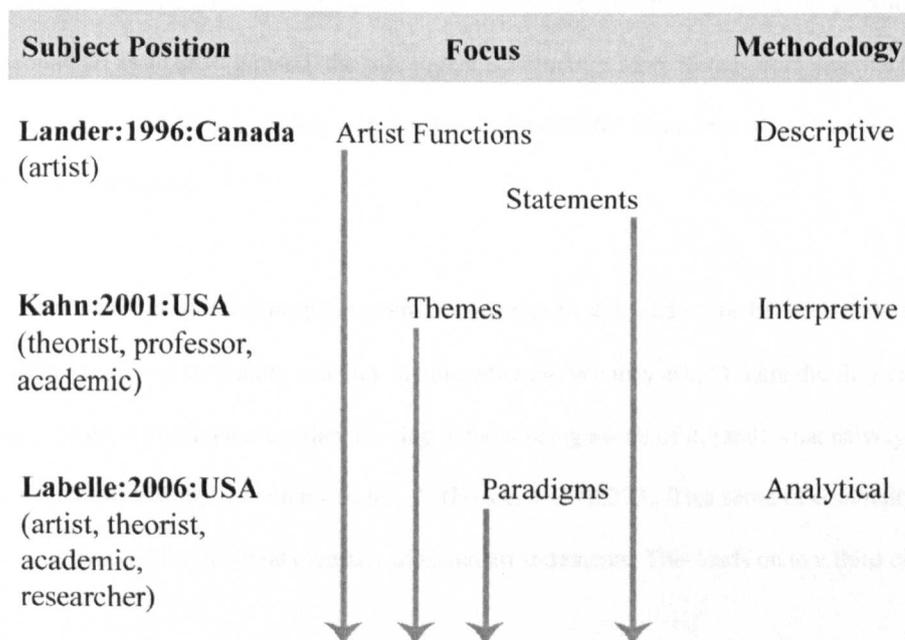


Figure 3.4. A Genealogy of Canonical Sound Art Discourse: Lander, Kahn and LaBelle.

This chapter has provided three archaeological snapshots of sound art discourse and Figure 3.4. provides an overview of this survey. Lander from 1990 was used to illustrate the interplay of artist-functions

and institutional agendas, and as the earliest of the three texts to appear, is typified by a **descriptive** methodology. Eleven years later, *Noise, Water, Meat* was published by American academic, Douglas Kahn. The book focuses upon themes and Kahn's **interpretive** method, and the latent power relations obscured by this treatment, are functions of the subject position of Kahn himself, his relation to institutions, and his subjective perceptual field of modernist auditory arts. Five years after this, we see the appearance of the **analytical** method of LaBelle, who, while working on the paradigmatic level, also centres his discussion upon central statements and provides an insight into three types of forms of specification that may be brought into play by audiences of sound art. The similarities, differences and rearrangements of materials and methods are used for a Foucauldian genealogy of sound art discourse to demonstrate the productive and changing nature of such activity.

This genealogical treatment of Lander, LaBelle and Kahn, allows us to make a number of Foucauldian-derived observations.

Firstly it shows the various subject positions that could be occupied at these various historical instants in relation to sound art discourse: Lander's descriptive account closely tied to his proximate position to sound art as an artist himself, the subsequent positionings more distant from practice (theorist, academic, researcher) and closely related to institutional entities (*MIT, Leonardo Music Journal, London Consortium* and *Continuum*).

Secondly we can note that despite certain divergences in style and scope between these accounts there is a notable degree of continuity and lack of contradiction. We may ask, "Where did they come from, towards what historical destination are they moving without being aware of it, [and] what naivety blinds them to the conditions that make them possible...?" (Foucault 1972:223). This sense of continuity and conformity is substituted for the great diversity of sound art statements. This leads on to a third observation.

Given the superabundance of sound art statements to be found in the archive (see Chapters 5 and 6), it is telling how Lander, LaBelle and Kahn each establish "a law of rarity" (Foucault 1972:134), including a relatively narrow range of legitimate statements in their accounts. Such statements are produced, reproduced and distributed in a manner determined by concrete choices and activities. Such activity

modifies pre-existing networks and our focus should be upon the rules of formation that allow these and no others to appear. This is the type of problematisation that I was aiming for in using Foucault's work, and there remains a wealth of material to be uncovered by such a method.

It would be usual to end this chapter at this point. Once conclusions have been reached, we would expect to move smoothly on to the next major section. However, as the *ImMApp* project developed it became clear that a significant amount of sound art was unaddressed by any of the three canonical texts. This was confirmed during my participation in various conferences, symposiums and masterclasses outside the United Kingdom. The research project offered opportunities to engage with sound art from a very different position to the 'culture-at-distance' methodology outlined so far (Lash 2002). Journal papers and posters were presented at:

- *Sound and Anthropology* Conference. University of St Andrews, Scotland, 2007.
- *ICMC 07*. Copenhagen, Denmark.
- *Auditory Cultures* Conference. Copenhagen, Denmark, 2007.
- *Atlas of Culture Space*. Conference, Korean Institute of Science and Technology, Korea, 2008.

Creative participation occurred during:

- *Cybersonica 2006*. Dana Centre, South Kensington, London.
- *Sound & Anthropology Residential Research*. The Burn, Scotland, 2007.
- *The Art of Immersive Soundscapes*. University of Regina, Canada, 2007.
- *Performance of Sound Conference*. Tate Britain, May 2007.
- *Prisma Forum 2009*. Oaxaca and Mexico City, Mexico.

And in the following, PhD research was combined with my broader creative practice as an artist, musician, instrument builder and improviser:

- David Toop's *Unknown Devices: The Laptop Orchestra*. 2006-2009
- *OpenForm Festival 07*. Oslo, Norway.
- Residency at the *Kunstlerhaus Schloß Balmoral*. Bad Ems, Germany, 2008.

In working outside the UK, I was exposed to other forms of sound art and other discourses clearly distinct from the material I had found within the English language literature. Through these experiences, the theoretico-active and productive nature of the canonical texts became apparent²¹, and their formulations of ‘major’ sound art history as investigated earlier in this chapter, I will contrast with a notion borrowed from Giles Deleuze and Felix Guattari.

3.5. Deleuze and Guattari: Major, Minor & Minoritarian

“The concept of a minor literature permits a reversal. By not relating ... to a pre-existing category, it will henceforth serve as a model for certain ‘bi-lingual’ practices that, until now, had to pass through a long purgatory before even being read, much less recognized.” (Deleuze and Guattari 1986:xiv)

Beyond the seductive conceptual tropes developed by Deleuze and Guattari that inspired me in thinking about designing in virtual 3D space (Chapter 6 (p89)) one particular aspect of their work became more interesting to me; that of the major and the minor.

For Deleuze and Guattari, “the major is that [which] can be made to serve as an idea, category, or constant against which whether explicitly or implicitly, other phenomena can be measured” (Joseph 2008:48); examples they use are the functions of major languages, sciences and literature and as such may be typified by unity and the power (*pouvoir*) of **constants**.

The minor “is not the qualitatively or quantitatively inferior, but what is marked by an irreducible or uncontainable difference. It is not a subcategory or subsystem in a conventional sense, but what Deleuze and Guattari term at one point an ‘out-system’ (*hors-système*) typified by multiplicity and the power (*puissance*) of **variation**. A minor history applied to the context of exploratory sound work is explored by Joseph in *Beyond the Dream Syndicate: Tony Conrad and the Arts after Cage* (Joseph 2008), and I have extrapolated his discussion to a wider set of artists working with sound.

²¹ This insight was an important motivation for undertaking the interviews with the Canadian artists discussed in Chapter section 3.1 (p29).

Deleuze and Guattari explore this area most extensively in their reading of Kafka (Deleuze and Guattari 1986). Their treatment of his writing is contrasted with the over-determined psychoanalytic and/or theological discourses commonly brought into play in the attempted territorialisation of Kafka's practice into major literature. Deleuze and Guattari wish to avoid a recuperation of Kafka's work, and seek to evade the "black holes" of "hard segments" (ibid:x). They suggest a need for new philosophical and psychological categories (an ontological schema) to come to terms with Kafka's unique oeuvre, and it is from this notion that the minor is derived.

Important to Deleuze and Guattari is the avoidance of preformed formal oppositions (art/music, noise/silence, high/low). Hence, sound art can properly be treated as an experimental machine, a complex assemblage of entities irreducible to binary formulations, dominant or transcendental signifiers, or any other 'phantasms'. Hence the "inexhaustible, intermediate world" (Benjamin 1969) of sound art cannot, and should not, suffer an excessive reduction through its framing by the major. This excessive reduction is, in my view, manifest in the texts of LaBelle, Kahn and, to a lesser extent, Lander. Rather than this reduction, the new category (the minor) is proposed as essential in dispensing with the dualisms that "ultimately constitute a fortress".

We must also be careful not to frame the relation of major to minor as such a simple opposition. We should expect transitional zones between territories of minor space (e.g. "zones of indiscernibility" (Deleuze and Guattari 1987:112)) and we should consider how the more something becomes major, the more likely it is to be affected by variations constantly transposing it to the status of the minor. We may take the many forms of the English language as an example of this phenomenon (e.g. patois, creole, regional slang). It is this state of continuous variation, identified by Deleuze and Guattari that I found so relevant to sound art (Deleuze and Guattari 1987:116).

We have seen how they contrast the **constant of the major** with the **variations of the minor**. They go on to discuss how the latter are defined through their deviation from the former, yet at this point they identify a third possibility, the "minoritarian", that occurs when a variation appears with no reference to the constant "majoritarian fact" (Deleuze and Guattari 1987:117). We may treat the "majoritarian fact" in Foucauldian terms as synonymous with the legitimated statement appearing in the historical archive, and

minoritarian sound art as “a potential, creative and created, becoming”. Such a notion goes some way to articulate the objections to the major Cagean “facts” made by Obadike, Lopez, Neuhaus and Dunn in Chapter 2, to highlight the potential of minor practices to create unanticipated movements in the major (for example the impact of the Minimalists Young, Asher, Morris on broader art discourse) and also to enable us to describe the diverse aspects of contemporary sound art as simultaneously **major, minor and a becoming-minor of the major**.

“By using a number of minority elements, by connecting them, conjugating them, one invents a specific, unforeseen, autonomous becoming” (Deleuze and Guattari 1987:118).

We may also connect these theoretical concerns with the Heimbecker interview. Like Kafka, Heimbecker has, for a long period, questioned traditional creative practice. Neither of these artists’ work is situated in mimetic opposition to the major, but rather in a contrary position of alterity. Their aim is not to subvert existing forms, but to find new ones. The appearance of new forms operates to short circuit the appeal of the major. This dismantling or demolition of discourse, for which the minor is the “instrument par excellence” (Deleuze and Guattari 1987:167) always creates a disorientating, transitory chaotic state: one difficult for a major discourse to territorialise.

In Deleuze and Guattari’s *Kafka*, instead of the type of expert exegeses produced by Kahn and LaBelle, we find a practical reading, where Kafka’s practice is considered a “machine of expression” capable of disorganising its own forms of content. We may consider sound art as a comparable deterritorialising practice. Institutionalised specialists, such as Kahn and LaBelle are “disciplinary forces reterritorialising the openness of a writing” (Deleuze and Guattari 1986:xxii) and Deleuze and Guattari are clear that the active production of the archive is a political practice. They suggest that the seeming integrity of academic specialization is in fact an alibi for the inevitable exploitation of art criticism for political ends. Inter and intra institutional struggles, perhaps of the type outlined in the example of the Canadian context, exclude such subjectivities as Heimbecker, whose practice has tended towards the directions suggested by deterritorialisation. Going further in this direction, “to the point of sobriety” (ibid: 26) is one possible strategy, while the inversion of this trajectory, the “artificial enrichment of the major” is articulated by the High Culture and Hollywood Models outlined in the *ImMApp* ontology.

It was with these considerations in mind that the next stage of research was undertaken. The linear paradigms of the print-based elements were to be contrasted with an alternate methodology, one based in the theoretical terrain outlined above and in the rhizomic constructs of digital media. Before we visit the *ImMApp*'s facility to provide an inclusive framework for a creative presentation of sound art, we will turn to two pre-existing digital projects which provide some precedence for the more exploratory practice-based aspects of the *ImMApp*.

Chapter 4. Sound Art: Gutenbergiana²² to Digitalis.

“Who is aware when reading a text on a page that the experience is flattening the multi-dimensionality of acoustic space and the world prior to the alphabet?” (Levinson 1999)

Recent years have witnessed the spread of information technology as a means of knowledge production, storage, distribution and consumption. New information spaces have been generated in the nexus of the academic, industrial, commercial and military sectors. The ubiquity of the digital computer is now established, and the *ImMApp* critically engages with this ‘new media’ and explores how such technologies offer a different set of methodological tools to the researcher of sound art, in distinction to the print-based methods and pre-digital discourses addressed in the previous chapter.

The purpose here is not to offer a techno-utopian vision of a digitalised future, nor to provide the contrary, and equally facile, dystopian version of events. Rather, the *ImMApp* aims at a practical exploration of a small subset of digital technologies with the conviction that this intersection of theory and practice, informed by Foucauldian problematisation, will contribute to an enhanced understanding of sound art and the effects of using such media to present historical and contemporary auditory practice²³.

There is significant overlap between the aims of the authors previously discussed (Lander, Kahn and LaBelle), the digital resources discussed later in this chapter and the aims of the *ImMApp* – namely a **mapping** of sound art. There are however, also significant divergences. Primary among these, and most clearly revealed between the print-based methods of Lander, Kahn and LaBelle, and the more developed aspects of the work undertaken in the digital domain, is a shift from the creation of historical narratives based upon natural language to the generation of interactive ontologies based upon algorithm.

We should understand this shift as occurring in the broader historical change articulated by Marshall McLuhan in the mid-twentieth century as the overlaying of mechanical media (print), with electric

²² (Kittler, von Mücke et al 1987:109)

²³ My aim in this chapter is to provide a pragmatic means of contextualising the digital practice developed in the course of the *ImMApp* project. A more explicitly critical reading of McLuhan and, especially Manovich, while potentially valuable in more deeply questioning digital media, must remain outside the scope of the current work.

(telematic), and more recently, electronic (computational) technologies. While we should understand such changes as potentially disruptive, the continuities between eras are also important. As Manovich identifies, new media is typified by its partial superimposition over previous forms (Manovich 2001). This observation is useful for two reasons; firstly it explains the awkward framing of sound art by fine art and music, i.e. agents relating an emergent creative form, sound art, to proximate and previously existing practices. Secondly, the formulations of McLuhan and Manovich help us question both the print-based practices of Lander, Kahn and LaBelle, and the strategies used in the digital resources discussed later in this chapter.

The three canonical texts discussed in Chapter 3 use a mechanical form of communication (print) to structure a retrospective canonisation of a creative practice (sound art) that occurred in, and was informed by, electric, and subsequently electronic, paradigms. This inverted layering (of the mechanical over the electric and electronic) can be healthily problematicised. In considering the digital resources, we can analyse the way that these are influenced by print formats, and how such endeavours can be critically addressed from an expanded sense of the digital as presented by the *ImMApp*.

4.1. Marshall McLuhan: Print Media, Messages, Sense Ratios

“The interiorization of the technology of the phonetic alphabet translates man from the magical world of the ear to the neutral visual world.” (McLuhan 1962:18)

McLuhan was hugely influential and he addressed a range of technological and social issues. His primary concern however was the effect of media upon cognitive organisation within subjectivities, and he understood how such activity is productive, in Foucauldian terms, of discourse. The idiosyncratic treatment of media he provided (McLuhan 1962), (McLuhan 1964), is problematic, and his work has been roundly criticised. His ideas, however, have much to contribute to the *ImMApp*, proposing as they do, challenging conceptions of technology and auditory practices.

For McLuhan, technologies are extensions of human physiology and psychology. He presents, for example, clothing as an extension of skin, the hammer as an extension of the arm, and writing as an extension of oral-aural language. His work offers a confrontation of the forces shaping human perception

and argues that a process of interiorisation follows the introduction of a significant new technology (the phonetic alphabet, the tape machine, digital technology), and this changes our relationship to the world, to ourselves and to each other.

A key technology for McLuhan is the printing press, as evinced by the title of his 1962 publication *The Gutenberg Galaxy: The Making of Typographic Man* (McLuhan 1962). In this text, and the book that followed it (*Understanding Media: The Extensions of Man* (McLuhan 1964)) McLuhan explored how the printing revolution changed the range of mental processes available to subjectivities of the time, manifesting “a stark division and parallelism between a visual and an auditory world” (McLuhan 1964:113). Such assertions have been touched on by Lexier (in Lander 1990) who addressed the difficulty of translating phenomenological experience into text (p30). McLuhan, somewhat deterministically, asserted that the phonetic alphabets, in which semantically meaningless letters correspond to equally empty sounds, are the sole technologies (media) forming industrial subjectivities, and for McLuhan, his followers and many other theorists ((Innis 1950), (Ong 1982), (Havelock 1986), (Ridley 2004)) this has profound ontological implications²⁴. The individualised, continuous and uniform visuality of literate cultures is contrasted with the compassionate and discontinuous auditory modalities of tribal cultures. Literacy involves the operation of linear rationality which overdetermines the profoundly non-linear, non-sequential totality of a given perceptual field.

We have seen in the previous chapter, how those texts, enabled and limited by their interactions with institutions and subjectivities, and the differential degrees of resistance on the part of the author-functions (Lander, Kahn, LaBelle) in the face of these power relations, were important in shaping the scope of the social practices (sound art(s)) remediated by their theoretico-active participation in the ongoing re-formation of the archive. We may now enhance this Foucauldian-derived analysis through the evocation of McLuhan’s most well-known mantra, “the medium is the message” (sic) and seek to apply this to the print-based practices of Lander, Kahn and Labelle and propose that the interaction between discourse, subjectivities, institutions and **technology** contributes to the ongoing formation of a discursive system of knowledge and power.

²⁴ This unilinear view of the effect of technology upon society is argued to be unduly deterministic in such texts as (Gere 2002) and (Kittler 1990) and Sterne provides an extensive critique of the assumptions built upon the work especially of Ong (Sterne 2003).

We have seen how Kahn's contribution can be critiqued for its over-determination of modernist sound art as derived from the positioning of the author-function within a specific discourse (Western fine art / art music). We can now say that information technologies (the alphabetic monopoly (Kittler, von Mücke et al 1987:104)) are also closely correlated to such discourse and are historically and geographically determined. As such, the three canonical texts gain an additional level of possible analysis, one centred upon their appearance in the archive as texts (written words), rather than any other form of media. Following this observation, we may conclude, for example, that LaBelle's book presents a specific and exclusive narrative arch, not only because of his relation to the institutions enabling and limiting the appearance of his statement into the archive and his relation to the field of study (sound art), but also how he interacts with both of these through his chosen information technologies. Here we may speculate that digital technologies were important in LaBelle's project (emails, word processing, bibliographic tools, internet research) but that the media form chosen as the final delivery platform (a book), restricted his engagement with such media. As such, the final book-form remediated a semi-digitised research process. *Immersion* can be contrasted with this as it affords primacy to the experiential characteristics of sound art statements, without remediating these back into mechanical media forms through interpretive 'deep readings'.

In contrast to my own critical engagement with contemporary information technologies, the "rear-view mirrors" (McLuhan 1962) of Lander, Kahn and Labelle, prefer instead to offer a comfortable reterritorialisation of, what was, avant-garde practice, in the ancient print-medium, evidencing a practice based upon linearity, stasis, authority and capital. While such contributions have their value, it is important that they should also be viewed as problematic, as, in the words of Kittler, "writing stores only the fact of its authorization" (Kittler, von Mücke et al 1987:107).

The practice-based elements of the *ImMApp* enable a range of cognitive processes exterior to those explicitly legitimate within print-based approaches. The conclusions of the *ImMApp* research are functions of the intersections of the multiple roles of researcher/artist/programmer with the "post-convergent" (Nash 2007) form of the final thesis; an assemblage of written text, database application (*Surface*) and IDE (*Immersion*). This "machinic assemblage" (Deleuze and Guattari 1987) has also been enabled/ limited through the relation of my own positioning to institutions and knowledge with each of these intersections

occurring within the wider field of knowledge production, distribution and normalisation. These issues are further explored in Chapters 5, 6 and 7.

We will now move to a survey of sound art as presented in digital media, before discussing my own re-presentation of such material (Chapters 5 (p67) and 6 (p89)). The resources to be reviewed here are *The Australian Sound Design Project (ASDP)* and *soundtoys.net* and these discussions will provide insight into how digital media can contribute to an alternate framing of sound art. The *ASDP* was chosen as a suitable case study due to its typical nature as a web-based sound archive. While there are comparable examples of online audio databases *UbuWeb* (Goldsmith 1996), *The British Library Sound Archive* (Ranft 2000) and *SARA* (Waters, Rogalsky et al. 2002) none of these address sound art specifically. *Soundtoys.net* was chosen due to its forward-looking engagement with contemporary media. It greatly expands the scope for digital media to document multimedia artworks, and the innovative designs found on the site point towards the exploratory nature of the more advanced creative output of the *ImMApp*.

4.3. *The Australian Sound Design Project (ASDP)* ²⁵

“[*ASDP* Project Aims] To compile the first major study on Australian sound design of public acoustic space through a nation-wide website and database [...] A representative sample of sound designs, both indoor and outdoor will help to establish this national practice. Historical and stylistic trends can then be observed.”

(Bandt 2005a)

The *ASDP* website (Figure 4.3a) was established in 2005, is led by Dr. Ros Bandt, and focuses on public sound installations. It has links to such significant institutions as *IRCAM* and the *World Forum for Acoustic Ecology*. The site is hosted by the *University of Melbourne* and receives support from the *Australian Research Council (ARC)* and the *Australia Council for the Arts*.

²⁵ This section contains extracts of a paper delivered at the *Digital Archive Fever* Conference. Birkbeck College, University of London. 8-9 Nov 2007. Facilitated by the *CHArt Society (Computers and the History of Art)* and organised by *The Courtauld Institute*.

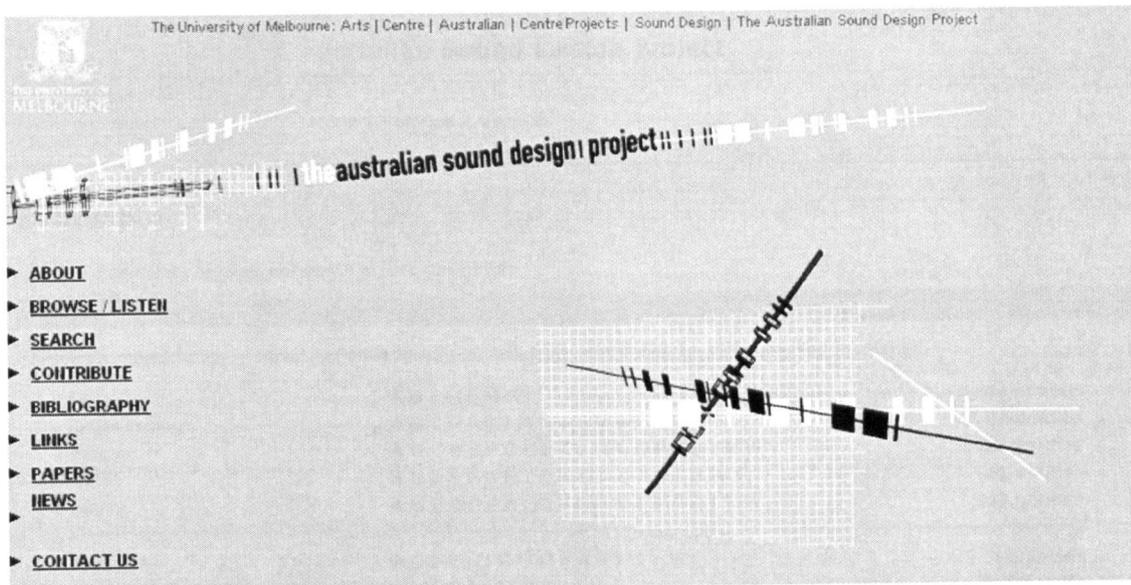


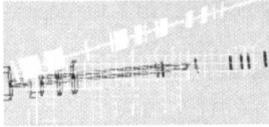
Figure 4.3a. *The Australian Sound Design Project* Homepage. (Bandt 2005a)

4.3.1. How a Digitised Methodology Contributes to an Enhanced Discourse Analysis

“The ... website(s) in this study will be invaluable in bringing much of this disparate work together for informed study and debate. The ... practice of sound design will be more fully understood.” (Bandt 2005a)

The *ASDP* is seemingly motivated from comparable national concerns to those discussed in the interview with Hildegard Westerkamp (Appendix 1 (p121)), but such an agenda now relating to the Australian context. Specific aims of the *ASDP* are to “establish the field of sound design in Australia”, “provide evidence of Australia’s important contribution in the field”, and to “provide a historical perspective on the nature of this new practice and its rapid emergence superimposed upon an ancient sung culture” (Bandt 2005a). The nature of the relations between the *ASDP*, its host institution, and the funding bodies, the convergences and divergences in their respective agendas, while outside the scope of the current work, would be an illuminating area of research.

Over 200 artist-functions and examples of 139 works (statements) are represented on the site, supported by text, photos and audio and video files. The *ASDP* features a search facility, bibliography, related academic papers, and the usual website conventions of links, news and contact pages, the site being structured around an arboreal hierarchy and its visual identity based in print-derived 2D blocks and lines (Figure 4.3b).



Australian Sound Design Project

Browse

[Home](#) | [Browse](#) | [Search](#)

Browse

Click on a letter to browse alphabetical lists of entities.

ABCDEFGHIJKLMNOPQRSTUVWXYZ [Search](#)

Australian Sound Design Project consists of 376 entries with references to 355 published resources.

Events	A B E H L M S T	14 entities
Organisations	A B C E F G I M N S U V W	37 entities
People	A B C D E F G H J K L M N O P R S T V W Y	125 entities
Sites	A B C E F G H I K M O P Q R S T U W Y	61 entities
Works	A B C D E F G H I K L M N O P R S T V W	139 entities
Functions	A C E F G I K M O P R S T U V W	74 descriptors
Bibliography	A B C D E F G H I J K L M N P R S T V W X Y Z	355 citations

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 Prepared by: Acknowledgements
 Updated: 18 January 2007
<http://www.sounddesign.unimelb.edu.au/web/browse.htm>

[[Top of page](#) | [Australian Sound Design Project Home](#) | [Browse](#) | [Search](#)]

Figure 4.3b. *The Australian Sound Design Project* ‘Browse’ page. (Bandt 2005a)

While an analysis carried out from a printed page may support discussions of the hidden intent of an **artist-function** or an apparent obscured meaning of a **statement** (artwork), the approach adopted by the *ASDP* provides an alternative analysis, one facilitated by algorithm and the relational database. While it is not completely successful in freeing itself from certain constraints inherited from print media, the database/website format does enable us to consider practice from a different perspective; one which is compatible with a **descriptive** methodology informed by Foucault.

We can see that since the earliest work Australian sound design statements occurred at 14 events associated with 37 separate institutions, ranging from media schools (*Australian Film, Television & Radio School*), networks (*Australian Network for Art and Technology, New Music Network*), associations (*Australian Computer Music Association, Australian Forum for Acoustic Ecology*), universities (*University of Technology Sydney*) and research institutes (*The Spatial Information Architecture Laboratory*), to cultural institutions (*Museum Victoria, IHOS Opera*), websites (*FurtherNoise, Clatterbox*) and a large number of commercial entities (*Activated Space, Wax Sound Media*). 125 individuals are visible who occupy a number of subject positions: Bandt, for example, describes herself as, “Artist, Composer,

Consultant, Curator, Sound Designer, Sound Sculptor, Theorist, Visual Designer, Improviser and Installation Artist". The geographical distribution of the 139 Australian sound design statements describes 61 distinct locations, including public and private galleries (*Bonython Gallery*), cultural institutions (*Grainger Museum, Mildura Arts Centre*), geographic sites (*Australian Capital Territory, Bray's Bay*) and civic buildings (*Cairns International Airport*).

It is this "sectioning up" of practice (Heimbecker 2005), that provides an alternate means of relating discourse to social practice. Rather than a historical narrative focused on the elite of the metropolitan avant-garde-that-was (Lander, Kahn, LaBelle), the *ASDP* offers a dispersed account of the specificities of (minor) auditory practice, albeit delimited by national boundaries.

Such practice is clearly understood to occur among and between a range of institutions (city councils, museums, and universities), **subjectivities** (academics, artists, consultants, and curators), **paradigms** (acoustics, participatory events), **apparatuses** (associations and networks), **surfaces of emergence** (yearly festivals, venues), **practices** (musical composition, research, workshops, exhibitions) and **techniques**.

The inclusion of commercial companies responsible for the most publicly visited soundworks is of especial relevance. Such ventures are significantly absent in the print-based discourses previously discussed. It is also clear that while the work of theorists working in the global metropolis is of value (Kahn is explicitly acknowledged), the narrow concerns of such major discourse has contributed in part to the marginalisation of "Australia's important contribution in the field", both internationally and within Australia. This reflects the excluding aspect of the theoretico-active formation of the archive from a position of Antipodean alterity.

4.3.2. The ASDP 'Functions': Tagging, A Developing Ontology

"A range of criteria will be applied to each...so that a comparative database ... of sound design processes can be cross-referenced in a fluid way...All the data will provide a basis for further analysis and comparison so that historical and stylistic features can be discerned." (Bandt 2005a)

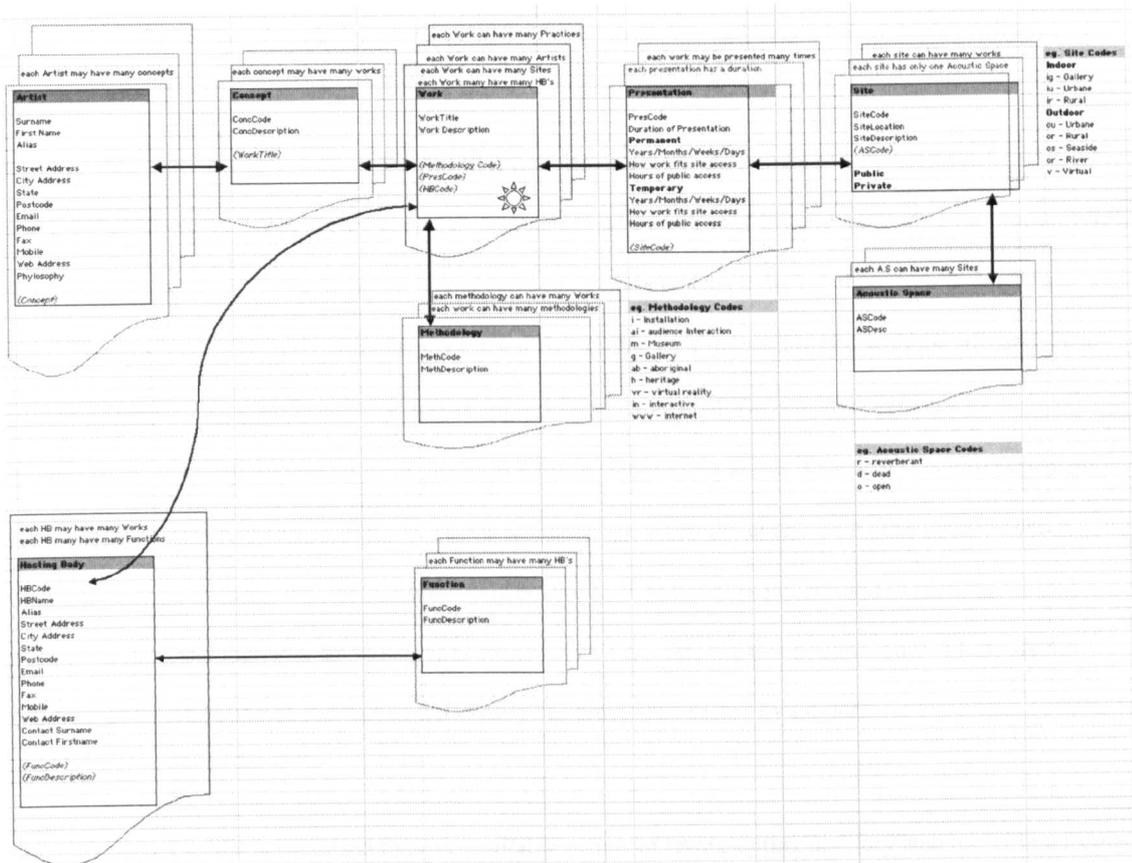


Figure 4.3c. The Ontological Schema of the ASDP (Bandt 2005a)

(<http://www.sounddesign.unimelb.edu.au/site/ACMCPaper/model.html>)²⁶

The second relevant aspect of the ASDP is derived from another convention of web design: one so ubiquitous that its value can pass unnoticed. Modularity is one of the defining characteristics of computer technology. The entities described in Figure 4.3c. (Artist, Concept, Work, Site, Hosting Body) can be viewed as distinct classes within an ontological schema. These classes describe the essential components of, in this case, Australian sound design, and the relations between them are articulated by 'functions' or 'descriptors' used by the site's designers. This fluidity of association is valuable in articulating the relative

²⁶ Accessed 14th September 2008.

nature of practice and has informed the development of the *ImMApp* ontology introduced in Chapter 2 (p24) and discussed more fully in Chapter 5 (Cross Referencing: Nodes: p74).

4.3.3. *The Primacy of the Auditory and the Visual*

“[ASDP Project Aims cont’d] To provide audio-visual examples of works...so that the practice can be judged through intimate knowledge of the primary source materials and their methodologies.” (ibid)

Another relevant aspect of the *ASDP* is how it presents sound artworks with accompanying multimedia. These multimedia elements take precedence in the pages of the site presenting the works. While supporting texts are available, these are enhanced and extended through digital photographs, MP3 files, and QuickTime movies. This is a particular strength of the *ASDP* site when contrasted with the still and silent pages of Lander, Kahn and Labelle. It seems appropriate that an art-form affording primacy to the auditory (public sound installation) should be archived in a format supporting audio. That sound is also dependant upon the peculiarities of time-space also seems to encourage video documentation. The audio-visual is understood to be primary, and the various treatments of such materiality understood to embody various methodologies (and therefore knowledge) as explored by disparate artist-functions. Such a formulation emphasises the difficulty of the “act of translation” as previously raised by Lexier.

Digital media is proposed then as a suitable means of re-presenting auditory statements in a format appropriate to the work’s initial identity. The methodology I have derived from *ASDP* avoids the (re)interpretive, as warned against by Foucault, and simply documents sound art statements as found in the dispersed historical archive. It connects these to a critical ontology, and provides them with a reinvigorated context for a phenomenological experience of their context-related auditory and visual characteristics. Before looking at how this was achieved (Practice Review: Chapter 5 (p67)), I would like to compare the *ASDP* with a second resource dealing with sound that approaches digital media from an altogether different perspective.

4.4. soundtoys.net



Figure 4.4a. The *soundtoys.net* homepage. (<http://www.soundtoys.net>)²⁷

Soundtoys.net is, like the *ASDP*, an online archive, but its presentation of audio-visual art is derived from a more contemporary discourse of digital media. *Soundtoys.net* deals with “serious issues around interactive arts, audio visual synthesis, generative art, and the history of interactivity” (Stanza 1998) and is supported by an extensive online journal compiling a range of written articles.

Soundtoys.net is supported by *The Arts Council of England*, *The Watershed Media Centre* in Bristol and also relies upon the efforts of volunteers. Unlike the *ASDP* the site is not formally linked to an academic institution but was conceived by a group of independent audio-visual artists. This difference is reflected in the way that *soundtoys.net* foregrounds its exposure at a number of international new media festivals²⁸, and it is through the association with these specific **apparatuses** and **surfaces of emergence** that the group seeks to normalise its practice. While these aspects are clearly relevant, the specific area I would

²⁷ Accessed 16th September 2008

²⁸ The *Den Haag Film & Video Festival 2002*, *Cyberonica '03*, London, *Newforms Festival Vancouver*, *Garage Art Festival*, Stralsund, Germany ICA, *Sonar Advanced Music and Multimedia Art Festival*, and the *Zeppelin 2002 Sound Art Festival*, Barcelona.

like to focus on is the respective engagement with the interactivity shown by the two sites and the implications this has for information management and knowledge transfer.

While the *ASDP* is an example of interactive media, its limited vision of such interactivity is made apparent by even a short visit to *soundtoys.net*. The *ASDP* functions entirely in terms of HTML, with interaction limited to hyperlink navigation. The screen is treated as little more than an illuminated page, albeit a page that facilitates non-linear connectivity, audio playback and moving image. On *soundtoys.net* however, while HTML is used, the aesthetic is more clearly defined by the *Adobe Shockwave* plug-in. As the *ASDP* is embedded within the practice of sound design in public space, and *soundtoys.net* within contemporary audio-visual practice, it is unsurprisingly that *soundtoys.net* should offer a more involved exploration of digital media. As we shall see, the strategy adopted by *soundtoys.net* opens out a range of expanded possibilities for interaction and engagement with its dataset, and such a strategy contributed to my own concepts regarding the design of *Immersion*.

4.4.1. Tagging on *Soundtoys.net*

all tags

2003 2005 2006 2007 3d abstraction aesthetics alife ambient animation architectural art artist atmospheres **audiovisual** automata body cars CCTV choreography city code collaborative collective commissions conceptual dance data database demoscene download dysfunctional electronics emotional environment essay exhibition explorative feedback figurative **flash** food game gameboy generative GPS graphical guns haptic imagination immersive installation instrument **interactive** interface interview jam java **journal kids** landscape language LED livecoding livefeed locative machine map MaxMsp midi minimal mobile monochrome multimedia multiuser music narrative navigable navigation net netart networked news noise offline **online** opengl opensource painterly passive performance photos php **playful** poem probability processing.org quicktime radio randomness reactive realtime repetition rhythmic robot samples score senses sensors sequencer **shockwave** simulated small software sonia soundart sounds soundscape **soundtoys** space stanza stereoscopic streaming synthesis synthesizer tagging text tonal tool touchscreen traffic transmission typography unconsciousness urban video virtools virtual virus VJ voice voip VRML website wireless xml

Figure 4.4b. The Tag cloud of *Soundtoys.net*. (<http://www.soundtoys.net/tags>)²⁹

²⁹ Accessed 10th October 2008

These important differences between the two sites can be seen in the way that content is structured and presented. Figure 4.3b. (p57) showed how the *ASDP* uses an alphabetic ordering of the entities presented on the site. While this enables goal-led **information retrieval** and would make finding a particular resource easy for those with detailed knowledge of the Australian context, it is restrictive and over-determined from an **information exploration** perspective (Ballay 1994). On *soundtoys.net*, material is treated as a more connective body (Figure 4.4b (p62)). Entries are cross-referenced with a number of tags, the relative importance of which, are emphasised by the font size of the respective tag. Whilst the screen is still treated as a two-dimensional array, this enhanced understanding of interactivity means the site supports users in navigation based on the semantic attributes of the site's content.

The tag cloud extends the approach of the *ASDP*, and like that project introduces a structuring strategy according to the specificities of its particular field. So the *ASDP* uses a two-dimensional linear sequence "A, B, C, D, ... Y" (x-axis) and "Events, Organisations, Sites, People, Works and Functions" (y-axis) to guide users towards content, while the tag cloud format allows the simultaneous presentation of **audiovisual, interactive, interface, playful, online, kids, generative, shockwave, soundtoys**. The *ASDP* imposes an arbitrary structure (the alphabet/ the line) over its material, while *soundtoys.net* foregrounds significant nodes through the semantic treatment of its content. It offers a form of information visualisation that the *ASDP*'s alphabetic approach does not have, and the characterisation of the data presented by *soundtoys.net* is of a more meaningful kind.

In addition to this treatment of content, the difference between the two sites becomes plain when considering two experimental interfaces commissioned by *soundtoys.net*. I would like to cite them as emblematic of contemporary digital paradigms, and they have, in part, inspired my own research³⁰. When I first experienced these Shockwave objects and the conceptual spaces surrounding them, I was enabled to think about the structuring of sound art in the *ImMApp* from a new position, one occupying a territory distant from the print-based practices of Lander, Kahn and Labelle, or the 2-dimensional model of digital space as used by the *ASDP*.

³⁰ Comparable work includes Diamond (2002) and Doruff (2006), who further explore the nature of contemporary digital media.

4.4.2. Two Explorations of Digital Space: Data as Creative Material

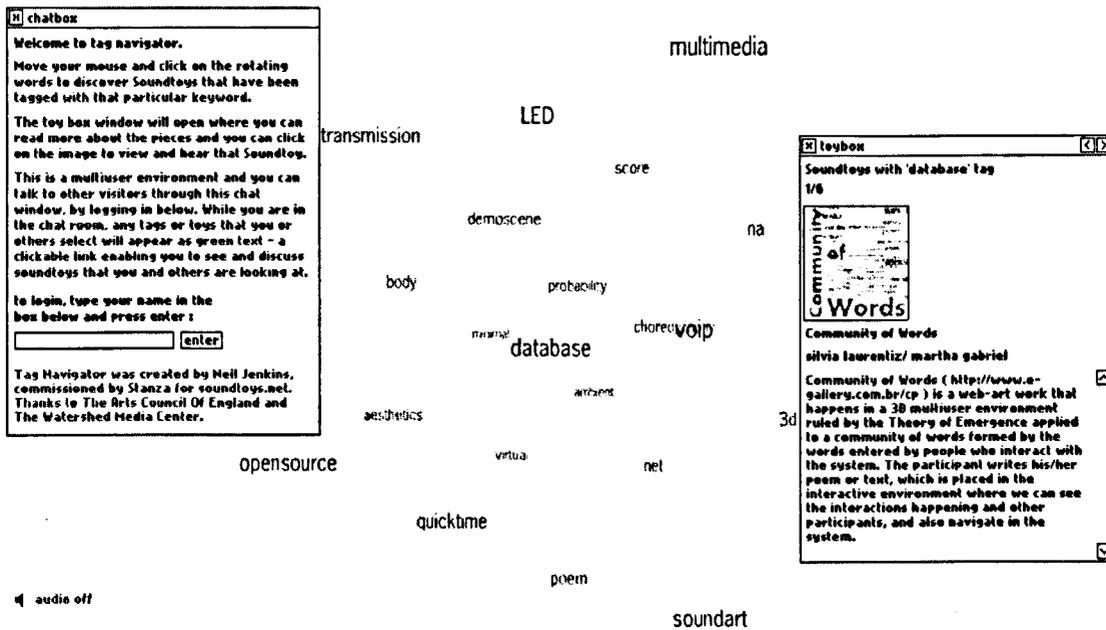


Figure 4.4c. *Tag Navigator* by Neil Jenkins (<http://www.soundtoys.net/toys/tag-navigator>)³¹

There are a number of artworks on *soundtoys.net* that use data as creative material. Examples can be found throughout the site with such sources as environmental sensors, RSS feeds and DNA sequences used as generative tools. In 2006 *soundtoys.net* commissioned several artists to create work using the site's own data content as raw material. The two works cited here are particularly effective in illustrating some of the possibilities explored in the *ImMApp*.

On visiting the page hosting Jenkins' *Tag Navigator* (Figure 4.4c.), one is faced with a near blank space. As the seconds pass, the space is populated by the tags discussed earlier, the difference being that here they are in motion in 3D space. Not only does the interface cast a conception of association away from linearity and stasis, it also proposes new possibilities for screen-based representations of information. In the digital realm, space, motion and change can be expressed, and Jenkins' *Tag Navigator* points towards how such potential may be used. The work is also a sonified multi-user environment, one that supports chat discussion between simultaneous users, and the possibilities of these aspects of contemporary digital media are clearly exterior to the scope of the *ASDP*.

³¹ Accessed 10th October 2008

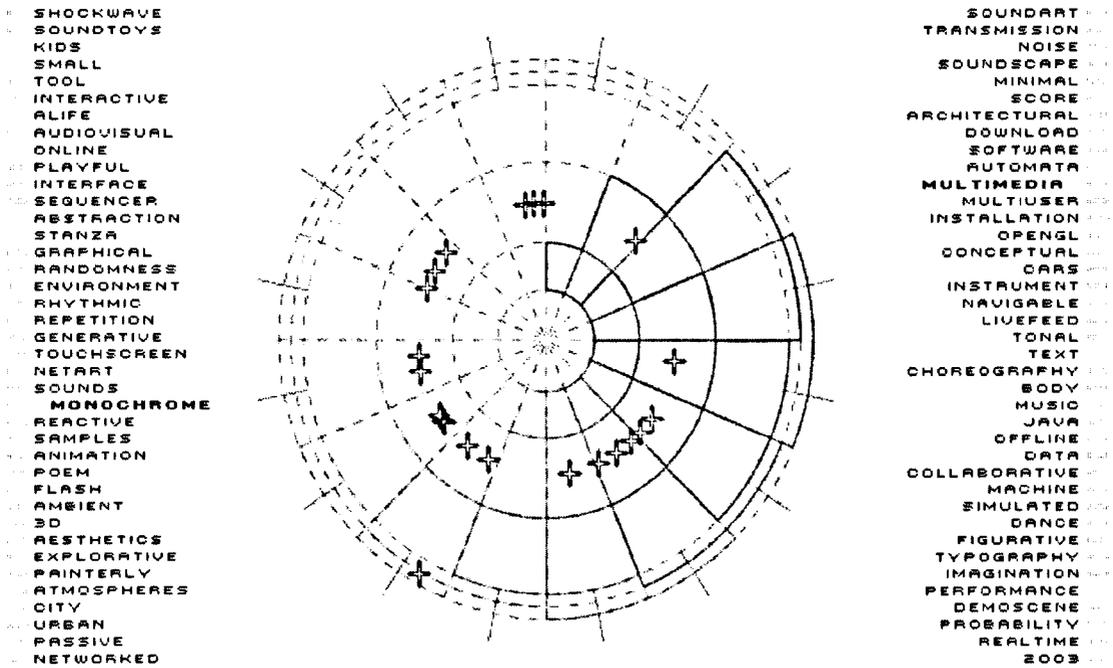


Figure 4.4d. Soundtoys.net content navigator (Adam Hoyle with Julian Baker)
 (<http://www.soundtoys.net/toys/soundtoysnet-content-navigator>)³²

The second example (Figure 4.4d.) more clearly explores the potential for digital space to be used as an active means of presenting data. Adam Hoyle and Julian Baker, like Jenkins, make effective use of blank space, but their interface provides more explicit structure. When a tag is clicked the most relevant content moves to the circle's edge while less relevant content remains close to the circle's centre. The interface is also a sonified work with active sounds linked to the currently selected tags.

In both these examples digital media is used to innovatively structure content, and the screen is approached on its own terms. The content descriptors, as introduced in the *ASDP*, are further developed to present users with an experience rich in terms of content and aesthetic. These works are cited here as examples of contemporary digital artists presenting information visualisations that articulate an underlying database architecture.

³² Accessed 10th October 2008

4.5. Chapter 4: Conclusions

The relation of the conventions of new forms of cultural production to pre-existing ones are explored by Manovich (Manovich 2001), and he argues how the assumptions made in earlier epistèmes become obscured, and their worldviews sublimated in endless plays of non-signification. An apparent evolution and growing sophistication in cultural production actually hides a deeper metaphysical bankruptcy. Hence, the example of the *ASDP*, while documenting a 'new practice', does so through an entrenched use of digital media which treats the screen fundamentally as a printed page. While *soundtoys.net* challenges this convention through the type of work presented in the site and its organisation of such content, the cited examples lack a critical vocabulary. The cited works are presented as innovative explorations of digital media and are offered as a line of flight away from the kind of impasse identified by Manovich. Whether they succeed in freeing themselves from this non-signification remains open to question; they do however expand the horizon of creative possibilities.

The *ImMApp* is located in a technologised context shaped by such resources as the *ASAP* and *soundtoys.net*. The observations of Manovich, McLuhan and Kittler have provided a critical vocabulary which has been applied to the creative aspects of the thesis, and we will now move to a discussion of these. Chapters 5 and 6 deal in turn with the two creative elements created for the *ImMApp* project (pgs71-82 and pgs83-87 respectively). The first element, *Surface* was devised to enable a means of managing disparate sound art material in the digital domain and emphasises goal-led **retrieval**. The first section of the DVD deals with this aspect. The second element, *Immersion*, innovatively re-presents this digital archive in the novel format of an IDE and it more closely facilitates more diffuse **exploration**. After this practice review, I show (in Chapter 6 (p89)) how the *ImMApp* succeeds in articulating the Foucauldian-derived ontological schema introduced in Chapter 2. It is while reading Chapter 6 that the second section of the DVD should be explored. I go on provide a comparison between the discursive space generated by the *ImMApp*'s treatment of a specific node ('Water') and Kahn's discussion of the same node. Before the concluding section of the thesis, I explore some characteristics of the minor history of sound art, an original research output informed by Deleuze and Guattari and wholly enabled by my engagement with immersive digital technologies.

Chapter 5. Practice Review: From Digital Surface to Digital Immersion

“How can an archive of sound art be presented in an immersive installation environment?”

Previous chapters, while exploring some aspects of my original research, have generally been exercises in scholarship. This chapter introduces the main body of my original contribution and discusses the creative practice of the *ImMApp*, which at any time was marked by a constant, intense, and productive movement between theoretical, discursive and technical domains. Some material for this chapter also appeared in two previously published papers (Taylor 2007a) and (Taylor 2008a)³³.

The question that opens this chapter was the central problem that needed to be solved in the design of the *ImMApp*. It can be disassembled into a number of related questions:

- What is needed to manage the large amount of material gathered while mapping sound art?
- Where might such material be found and what form might it take?
- How might the ethical dimensions of incorporating the work of other artists be dealt with?
- How may the approach expand upon the critical ontology established in Chapter 2?
- How may the work of the *ASDP* and *soundtoys.net* be built upon and extended?
- How may a surround sound digital environment be created from this dataset?
- How does such an environment contribute to a novel re-formulation of historical and contemporary sound art?

Each of these areas is addressed in this chapter, the exception being the final question which is discussed in depth in Chapter 6 (Sound Art within *Immersion* (p89)).

³³ Available on my website: (Taylor 2007a) [http://www.suborg.net/pdfs/Taylor_\(2007\)-IMMERSION-An_Immersive_Digital_Application_for_Creative_Interaction_with_Sound_Art_Archives_%20\(ICMC07\).pdf](http://www.suborg.net/pdfs/Taylor_(2007)-IMMERSION-An_Immersive_Digital_Application_for_Creative_Interaction_with_Sound_Art_Archives_%20(ICMC07).pdf) and (Taylor 2008a) [http://www.suborg.net/pdfs/Taylor_\(2008\)-An_Immersive_Database_of_Sound_Art-Towards_a_Minor_History_\(YCT2008\).pdf](http://www.suborg.net/pdfs/Taylor_(2008)-An_Immersive_Database_of_Sound_Art-Towards_a_Minor_History_(YCT2008).pdf)

5.1. Project Beginnings: The Database & Gathering Data

Information management was handled through an underlying database architecture; the rationale being that a server/database combination could be usefully deployed on a single non-networked computer providing a rapid and scalable means of data entry, retrieval and manipulation. *Apache* server and *MySQL* were selected due to their free availability and large support communities. It was important that this architecture should not unduly limit the forms of information to be included into the dataset. My emphasis was upon how a digital database may best articulate an inclusive mapping of sound art, where the nature of the information to be included was consistently variable and initially unknown.

With a database architecture established (*Apache/MySQL*), testing was necessary, and this required the database to be populated with the diverse types of information anticipated to be uncovered in the course of mapping sound art. Hence the process of collating the dataset which forms the core of the *ImMAp* was begun. A pseudo-statistical analysis was applied to the academic literature with those entities occurring most often first entered into the database. This activity first focused upon particular **artist-functions** and two strategies were used in selecting these. Firstly, a control group of core sound artists was assembled (Christina Kubisch, Christian Marclay, Ros Bandt et al), and secondly, more liminal subjectivities working on the margins of sound art practice were included. Bernhard Parmegiani and Luc Ferrari were primarily acousmatic composers for example and Dziga Vertov, Mary Ellen Bute and the Whitney brothers are associated with experimental film. The intention was avoid a normalisation of diverse and often conflicting and incompatible agendas (consider for example the profound differences between noise music and acoustic ecology) into a reified formulation of "SOUND ART". Rather than delimitation and definition, the aim was to assess how certain constituent elements of sound art statements, typified by heterogeneity, may be found in other, historically precedent or contemporaneous art practices, thereby exploring the tenability, or otherwise, of McLuhan's formulations discussed in Chapter 4. Hence the mapping of sound art also included **institutions** (as discussed in (Penwarden 2002), (Stockhausen 1985), (Buchla, Oliveros et al. 1994), (MoCA 1998)), **apparatuses and surfaces of emergence** (in (Furlong 1973), (Bull and Adrian 1979), (Conomos 1995), (Kangas 1996), (Harris 1998), (Cunningham 2000), (Crowe 2002)) **practices** (as discussed in (Iturbide 2000), (Shortess 1987), (Schaeffer 1994), (Lopez 1997), (Imada 2003)) and **paradigms/forms of specification** (in, for example (Bennett 1985), (Smith 1998), (Kahn 1993), (Higgins 1965)). An original sample of 20 case studies was taken, but it soon became clear that a larger

sample was required, and this soon increased. This was deemed necessary, if not to provide comprehensive coverage, then at least to open a space inclusive of as much diverse activity as possible in these early stages. It was also found that a threshold level of material was necessary for the later algorithmic manipulations to deliver meaningful results.

A great deal of data was accessed directly from the internet and a significant proportion of this was non-textual (photographic, audio, and video). However it is evident that text continues to be an important carrier of information along the digital network. It would seem that text-based treatments are extended by web formats. The common practice of presenting images, audio and video documentation in addition to texts (artist statements, articles, reviews and so on), points towards the facility of such multimedia to contextualise artworks in a perceptual modality (auditory, visual, time-based) appropriate to their original presentation.

This **non-interpretive historical compilation**, this skimming of information from the fragmented archive of the internet, was undertaken with Foucault always in mind³⁴. The activity was enabled and limited by the chosen methodology, and operated in a manner distinct from the treatments of Lander, Kahn and Labelle. Though more closely related to the *ASDP*, the *ImMApp* contains a greater range of material and is the most expansive collation of sound art material undertaken to date. At the time of submission the *ImMApp* database included 272 **artist-functions**, 4208 **statements**, 352 **institutions**, 1946 images, 1020 audio files and 134 video files.

At times, gathering data from the internet seemed a tedious and repetitive exercise in data entry (Figure 5.1 (p70)). However, upon reflection, this activity was a more creative process than that. This method of knowledge acquisition in the endless, changing and rhizomatic archive of the web represents a different form of engaging with sound art from that undertaken in the study of the centralised resources discussed in Chapters 3 and 4. Artist-functions, for example, are able to present documentation of their work any way they find appropriate. They are dependent upon no exterior legitimising force and what is presented on an individual's website, while subject to certain constraints, is done so in a relatively self-determined manner. My engagement with sound art was no longer directed by an authorial expert (Lander, Kahn,

LaBelle) or any centralised construct (*ASDP*, *soundtoys.net*). Though informed by these and other canonical resources³⁵, the exploration of the networks of sound art directly engaged with an account of practice located in the specific ruptures and linkages as presented by practitioners themselves.

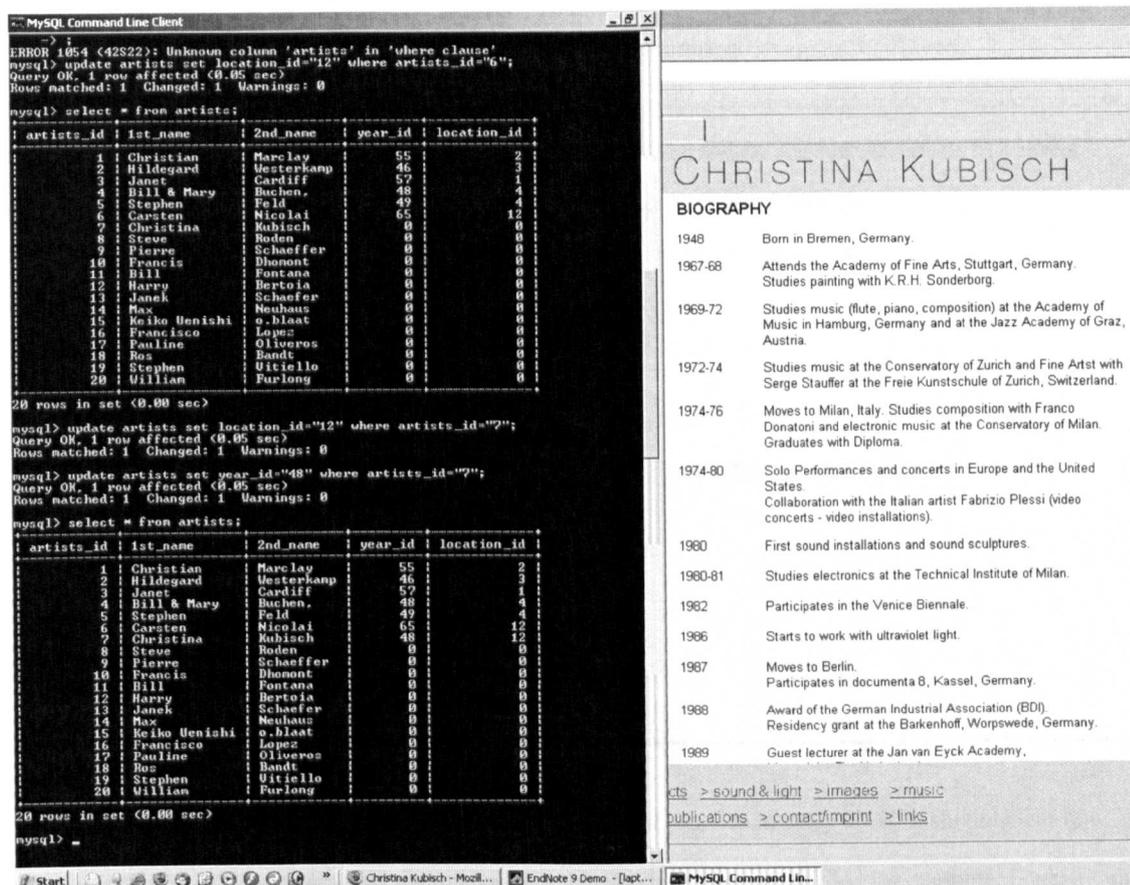


Figure 5.1. Command line MySQL database and Data Gathering Online.

This acquisition of knowledge has changed my own broader creative practice, and also been successful in unframing my pre-existing preconceptions of sound art. It has contributed to my development as an artist, and I would recommend an analogous research practice to others working in sound art, or indeed exterior disciplines. The value of this activity was also supported by the use of the evolving ontological schema. It was in order to facilitate the development of this, and to better enable interactions with the developing dataset that the first iteration of the *ImMApp, Surface*, was begun.

³⁴ While the reliability of information sourced from the internet can be questioned, the statements of each artist-function discussed in this thesis were verified during the ethical process of securing the permissions for the use of their work in the *ImMApp* project. (See section 5.3.4 (p76).

³⁵ Including Perrier (1995), de la Motte-Haber (1996), Shulz (2003), Licht (2007) and Gibbs (2007).

5.2. Surface

Research Journal Extract: 2006-08-21

I am beginning the first iteration of the application. The first steps are to install Apache server, MySQL and PHP.

10.30hrs Task 2006-08-21a: Install Apache Server

15.25hrs Outcome 2006-08-21a: Apache 1.3.34 installed. Service available at `http://localhost/`

Task 2006-08-21b: Install MySQL Server 4.1 and PHP 5

00.43hrs Outcome 2006-08-21b: Completed. I now have Apache running MySQL and PHP. Install into `c:/` as root

MySQL Place config file in root i.e. copy `MySQL/my-medium.ini` into `c/` and rename as `my.cnf`

PHP Copy `php.ini-recommended` from `/php` to `c:/windows` folder rename as `php.ini`

Check `doc_root = "C:\ Apache\ htdocs"`
`extension_dir = "C:\ php\ ext"`

and `extension = "php_mysql.dll"`

Copy `c:\php\libmysql.dll` into `windows\system` folder

Finally config Apache for PHP i.e. edit Apache config file `c:\ Apache\ conf\ httpd.conf`

Add `LoadModule php5_module c:/php/php5apache.dll`

`AddModule mod_php5.c`

`AddType application/x-httpd-php .php .phtml`

Reboot and point browser to: `localhost/phpinfo.php`

`<?Php phpinfo(); ?>`

This research journal extract documents the nature of practice in early 2006. It should clear how distant such practical considerations were from the type of discourse provided by, for example, Foucault and LaBelle. Even more striking was the rupture between digital theory (e.g. (Cohen, Elkins et al. 1997), (Manovich 1999), (Nechvatal 1999), (Svanaes 2000), (Gere 2002)) and the utterly pragmatic answers needed to move the project forward.

5.2.1. Surface: Introduction

At the outset of the project my understanding of web application development was of the most basic kind. While the use of MySQL/PHP/XML has delivered the project goals, it is necessary to articulate the technical challenges that have been overcome in the development of *Surface*. The lack of specialist knowledge is presented as a strength of the project and emphasises the contingent nature of this and all other archives: the construction of archives is in no way a natural or objective activity, but closely related to subjectivities, institutions, technologies and the historical conditions of their production.

Documentation of *Surface*'s development, in the context of these technical limitations is shown in Appendix 3 (p124). This series of chronological screenshots show the increasing sophistication of *Surface* which began at the most basic level of MySQL/PHP and gradually evolved into a fully-fledged database application. Figure 5.3a shows the final design of *Surface* and introduces how it has succeeded in extending the project's theoretical concerns into the digital domain.

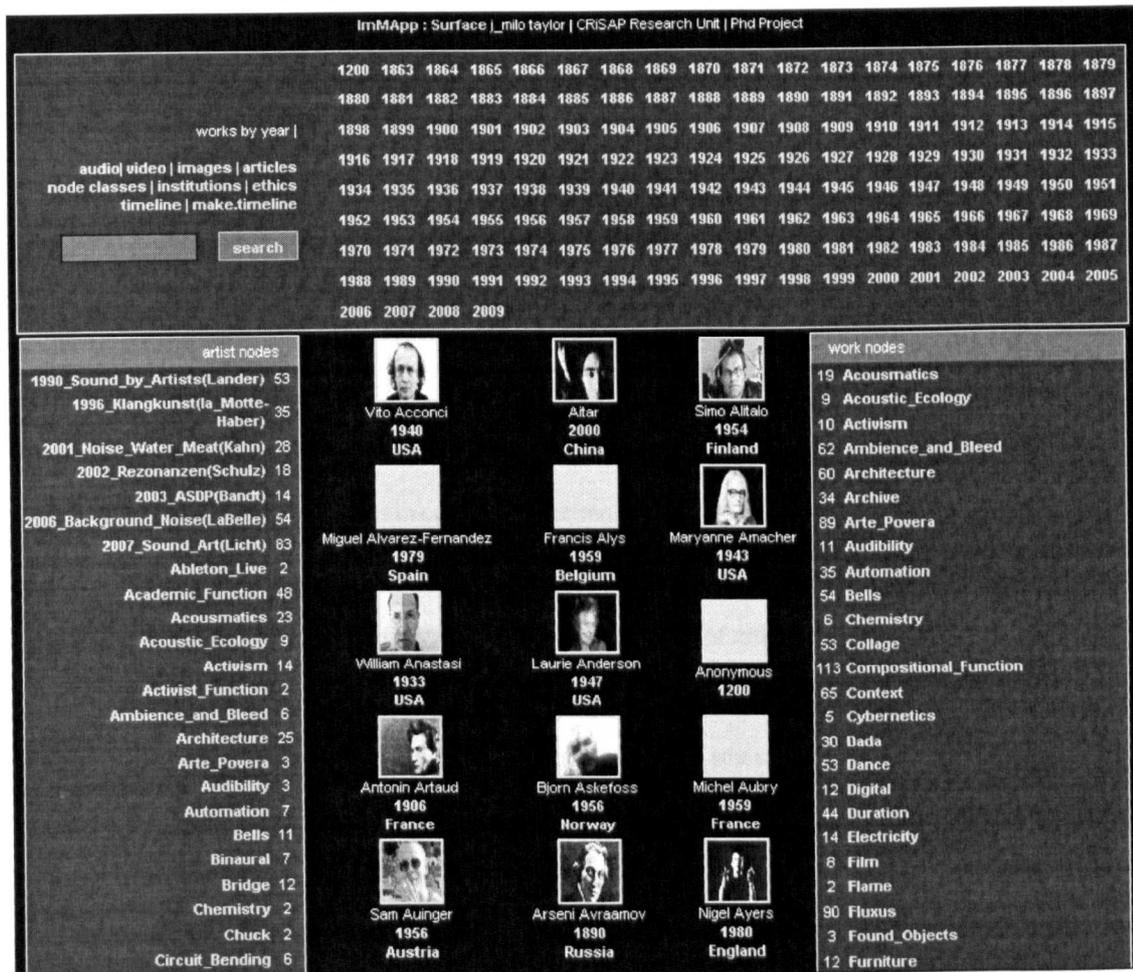


Figure 5.2a. *Surface*: Homepage



Surface: Introduction

A detailed overview of *Surface* can be found on the DVD; it highlights how it facilitates interaction with the dataset and introduces some of the design challenges faced in the project's development. It shows how artist-functions and statements are related to nodes and we begin to see how *Surface* evolved into a working research tool, useful not only to myself, but also other researchers of sound art. We also gain some understanding of the scope of material gathered and how it is presented in the digital domain. Three case studies (Sam Auinger, Nigel Ayers and Ros Bandt) are used to demonstrate the nature of *Surface* and how it presents a new and novel presentation of sound art.

5.2.2. Multimedia

A great strength of a digital archive is its ability to organise and present multimedia elements; in the case of the *ImMApp*, affording an appropriate primacy to audio, but also containing extensive documentation of still images, video and contextual writing. At this level, the *ImMApp* is closely related to other sound-orientated databases, for example, the *ASDP* (Bandt 2005a), *UbuWeb* (Goldsmith 1996) and *SARA* (Waters, Rogalsky et al. 2002), and these resources should be regarded as points of departure. The main difference between these, at least in their public incarnations, and the *ImMApp*, is that *Surface* was developed as a database application and not simply a mechanism for content delivery. This aspect of *Surface* is also discussed on the DVD where the writings of Ros Bandt ((Bandt 2003), (Bandt 2005b)), Vicki Bennet's (a.k.a. People Like Us) work with film archives (*A Story Without End* (England 2005)) and an installation by Sam Auinger (*Balance 1.0* (Germany 1996)) are used as examples.



Surface: Texts, Images, Audio and Video

Significant effort was spent in collating these multimedia elements, and this involved a sustained engagement with the networks of sound art. The activity served a dual purpose, firstly to populate the database, but perhaps more importantly, through a detailed survey of artist's websites, to establish the relationships between **artist-functions, statements, institutions** and geographical and historical contexts. Research pointed towards the fact that despite the heterogeneity of sound art statements, practice was typified by a relative homogeneity of legitimised subjectivities, in terms of gender, race and geographic location. These observations will be discussed at greater length in Chapter 6 (Evaluation: Sound Art from the *ImMApp* Perspective). It was in recognition of these potent categorisations that work on *Surface* focused for an extended period of time upon the cross-referencing of the transient subjectivities (artist-functions) with the potentially more long-lasting entities known as **nodes**.

5.2.3. Cross Referencing: Nodes

“We will enter, then, by any point whatsoever; none matters more than another... We will be trying only to discover what other points our entrance connects to...What the map of the rhizome is, and how the map is modified if one enters by another point.” (Deleuze and Guattari 1986:3)

Human longevity is limited, the productive life of an artist-function and the reception afforded to their statements (artworks) are subject to a range of forces outside the realm of their own personal agency. The life-span of institutions, while also possibly short, may extend several generations, and experience a different form of affordance. Discursive tropes (nodes), a far less tangible phenomenon, also have a life-span, and like subjectivities and institutions are changeable throughout their duration. *Surface*, in following the practices of the *ASDP* and *soundtoys.net*, provides a means of cutting through the stability ascribed to the artist-function by Lander, Kahn and Labelle, and proposes that the nodes embodied in an artist-function’s social practice (the production of artworks), offer us an alternative explanation for the relative visibility, or otherwise, of those statements within the archive.

In contrast to the period-based approaches of Lander, Kahn and Labelle, or the promotional agendas of the *ASDP* and *soundtoys.net*, the problem-based approach of the *ImMApp*, sought, from its initial conception, to explore the groupings found within sound art and to address them from a critical perspective. The combination of Foucauldian technique, as explored in Chapter 2, with the form of meta-tagging enabled by the *Surface* interface resulted in the refinement of the critical ontology introduced in Chapter 2. A comparison can be made between Table 3.1 (first introduced in Chapter 3 p41) which presents an overview of the schema implicit in LaBelle’s *Background Noise* with the now fully populated node classes (**subject positions, themes, techniques** and so on) (Figure 5.2b. p75).

Paradigm	Statement	Year	Artist-Function
Origins, dada, musique concrète	4' 33"	1952	John Cage, Pierre Schaeffer, Karlheinz Stockhausen, Group Ongaku
Happenings, Fluxus, Minimalism, Concept Art	<i>Box with the Sound of Its Own Making</i>	1961	Robert Morris, La Monte Young, Michael Asher
The Voice, Performance Art	<i>I am Sitting in a Room</i>	1970	Alvin Lucier, Vito Acconci, Christof Migone
Site-Specific Sound, Architecture	<i>Public Supply</i>	1966	Max Neuhaus, Maryanne Amacher, Bernhard Leitner, Iannis Xenakis
Acoustic Ecology, Sound Installation	<i>Soundmarks</i>	1977	R. Murray Schafer, Hildegard Westerkamp, Yasunao Tone, Bill Fontana
Interpersonal and Network Space	<i>Global String</i>	2002	Atau Tanaka, Achim Wollscheid, Apo33

Table 3.4. LaBelle's Schema of Sound Art

<p>14 Subject Positions</p> <p>Academic_Function Activist_Function Compositional_Function Critical_Function Curatorial_Function Designer_Function Female_Function Gendered_Function Musician_Function Performer_Function Queer_Function Racial_Function Sound_Artist_Function Theorising_Function</p> <p>31 Paradigms</p> <p>Acousmatics Acoustics Acoustic_Ecology Activism Biology Chemistry Communism Dada Dance Fascism Field_Recording Film Fine_Art Fluxus Industrial Klangkunst London_Silence Minimalism Minor Music Music_Theory Natural_World Op_Art Performance Physics Psychoacoustics Radio Sport Surrealism Theatre Video</p>	<p>18 Forms of Institutions and Apparatuses</p> <p>Archive Conference Educational Exhibition Festival Funder Gallery Journal Magazine Museum Organisation Publisher Radio_Station Record_Label Research_Institute Symposium Venue Website</p> <p>18 Practices</p> <p>Circuit_Bending Digital Improvisation Installation Instrument_Design Microsound Music Noise Performance Performance_Art Plunderphonics Sculpture Software_Design Soundwalk Spoken_Word Theatre Volume Wire_Recording</p>	<p>30 Materials</p> <p>Architecture Bells Bridge Clothing Electricity Flame Found_Objects Furniture Internet Loudspeakers Meat Metal Microphones Music Networks Noise Perousson Piano_Wire Radio Sensors Spoken_Word Tape The_Body The_Voice Trains Video Vinyl Water Wood</p> <p>5 Strategies</p> <p>High_Culture_Model Hollywood_Model Institutional_Model Public_Model Underground_Model</p>	<p>22 Concepts</p> <p>Acousmatics Acoustic_Ecology Arte_Povera C-Sound Circuit_Bending Cybernetics Dada Events Fluxus Found_Objects Indeterminacy Installation Intermedia Max/MSP Microsound Noise Op_Art Plunderphonics Soundscape Soundwalk Supercollider Surrealism</p>	<p>32 Themes</p> <p>Activism Ambience_and_Bleed Architecture Audiability Automation Context Duration Environments_and_Immersion Factory Forest Gesture Home Interaction Internal_Audition Journey Kinetics Listening Mobile Objecthood Ocean Railway Resonance Scientific_Phenomena Space Stations Synaesthesia The_Voice Transmission Visuality Volume Weather Work_and_Labour</p> <p>7 Canons</p> <p>2007_Sound_Art_(Licht) 2006_Background_Noise_(LaBelle) 2003_Australian_Sound_Design_Project_(Band) 2002_Rezonanzen_(Schulz) 2001_Noise_Water_Meat_(Kahn) 1996_Klangkunst_(Ja_Motte-Haber) 1990_Sound_by_Artists_(Lander)</p>	<p>31 Techniques</p> <p>Ablation_Live Binaural C-Sound Chuck Circuit_Bending Collage Context Digital Environments_and_Immersion Field_Recording Glitch Installation Instrument_Design Interaction Kinetics Listening Mail_Art Mapping Max/MSP Multichannel Narrative Percussion Performance Pure_Data Resonance Soundwalk Spoken_Word Supercollider Surround_Sound Synthesis Wire_Recording</p>
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Figure 5.2b. The ImMApp Ontology of Sound Art

Table 3.1, my abstraction of LaBelle's text, shows his view of sound art to be delimited by paradigms and structured by a teleological view of historical development. In contrast to this, Figure 5.2b. offers a schema typified by simultaneity whereby the representation of discourse may be entered into from a variety of perspectives. The level of detail provided by the *ImMApp* nodes should also be noted. This, in part, is due to the choice of information technology chosen for the *ImMApp* project, where its scope is unrestricted by the requirements of a print-based publication. Print forms, do however, provide precedence for such a seemingly novel arrangement. The form of the *ImMApp* ontology echoes that of bibliographies. This inversion of the norms of pre-existing media forms (book) is typical of new media projects (*ImMApp*), and resonates with the theorisations of McLuhan, Manovich and Deleuze and Guattari. The ontology shown in Figure 5.2b. is extended and enhanced in the digital domain and this is documented on the DVD.



Surface: Nodes and Ontological Schema

The relevant section of the DVD shows how *Surface*'s use of nodes allows a comparison between the subjective accounts of Lander, Kahn and LaBelle, and how this contributes to an alternate framing of sound art and a broader conception of what such practices may involve.

A second example (acousmatics) shows how *Surface*, while inclusive of a 'major' formulation of such a paradigm, typically focusing upon the author/composer (artist-function) and a filial canon of acousmatic composers (Pierre Schaeffer, Bernhard Parmegiani, Luc Ferrari, François Bayle, Giles Gobeil, and so on³⁶) also facilitates a renewed conception of such a paradigm through a focus upon the micro-scale of statements; in this case by the use of acousmatic techniques in the installations of Tilman Kuntzel.

5.3.4. Ethics

There were important issues around the incorporation of artists' material into the *ImMApp* database. There were ethical questions about the correct use of artists' texts, images, audio and video. Advice was taken on a number of occasions, and the *UAL Research Ethics Sub-Committee* contributed their expertise to developing best practice in this regard. Every effort was made to contact each invited artist and their explicit permission obtained for the use of their material. This brought the *ImMApp* research into direct

³⁶ *Surface*'s inclusion of composers outside the major canon of acousmatics should also be noted: Halim El-Dabh, Manuel Enriquez and Manuel Rocha Iturbide for example.

contact with the diverse range of practitioners under study. There were a number of extended exchanges between myself and artists and/or artists' estates regarding the *ImMApp* project, its purposes and its final form. While some artists declined to be involved, others sent additional material (Z'EV, Warren Burt, Steve Roden and Barry Truax). The majority of invited artists were keen to encourage a future, publicly available, version of the project. These dialogues further served to inform many of the conclusions reached regarding the framing of practice produced by Lander, Kahn and Labelle.

This process involved a great deal of administration, and *Surface* was used to manage this aspect of the work. While a secondary aspect of the research, it is documented on the DVD. A further useful aspect of this activity was a process of validation voluntarily entered into by invited artists. While the *ImMApp* is in no way definitive, it is at least, for those artists included in the database, in some way, accurate.



Surface: Ethics

5.2.5. Genealogical Timeline

The *ImMApp*'s expansive framework and the sheer amount of material contained in the dataset created a number of design problems. It was to find a means of articulating the genealogical scope of the project that an interactive timeline was implemented. This aspect of *Surface* was built using a widget developed at MIT, and distributed as an open source resource (MIT 2003).

The timeline gives an overview of the timespan covered by the *ImMApp*'s mapping of sound art by plotting the year in which each artist-function first produced a statement (artwork). Information is held from the latter half of the 19th century until 2009³⁷. The timeline also marks key moments in the (major) history of sound art. For example, the years of Historical Dada (1912-1918), the first performance of John Cage's *4' 33"* (1952) and the years of publication of major texts; Lander (1990), Kahn (2001) and LaBelle (2006).

³⁷ There is an intriguing work actually documented from 1200 which is well outside the general timeframe of the *ImMApp*. An Automatic Music Player attributed to an anonymous creator somewhere in Arabia is discussed in a German exhibition catalogue from 1980 (Duttman 1980). The same publication is the source for many references to idiosyncratic sound objects and automatic music players produced years before the productions of Duchamp, Russolo and others which are claimed to provide the historical origin of sound art.

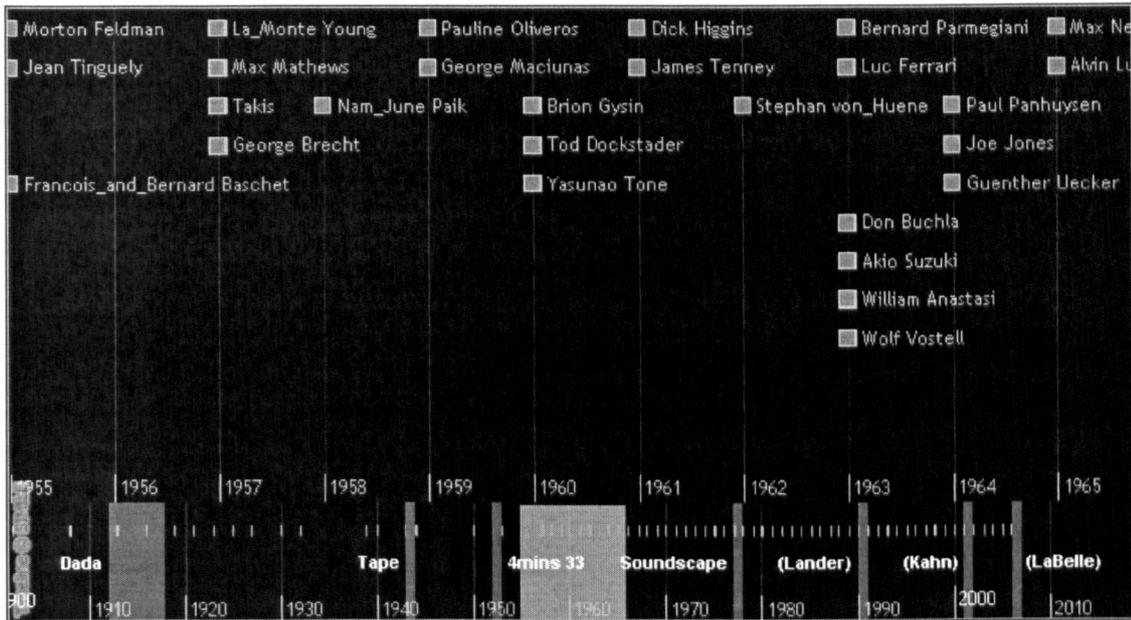


Figure 5.2 c. Interactive Timeline (Modification of Simile Timeline <http://simile.mit.edu>) (MIT 2003)



Surface: Genealogy 1: Artists' Timeline

The timeline shows a number of epistemic shifts in the degree of production: There is a first wave of significant activity beginning in the early 1950's with already diverse range of statements being produced. There was of course significant activity before this time, but it is sporadic and exceptional, rather than regulated and systematic, which is increasingly the case as time passes. Hence by the early 1960's the number of artist-functions involved in production doubles and this doubles again in the 1970's. As the present is approached, each passing decade marks an exponential increase in the number of artist-functions involved in the production of sound art.

5.2.6. Genealogy 2: A History of Statements

In order to successfully extrapolate Foucault's ideas into the domain of sound art, such a genealogical account must operate on the level of the statement. It is to those aspects of *Surface* that engage at such a level that the DVD then documents.



Surface: A History of Statements

The way that statements are treated in this genealogical timeframe is demonstrated by visiting a number of emblematic years. The main purpose of this exercise is to explore the expanded sense of sound art provided by *Surface*, and to demonstrate the value of multimedia in articulating such an expansive field of diverse statements.

Some of the specific statements which are referenced in relation to these concerns are *Automatic Music Player* (Anonymous. Arabia 1200), *Composition VII* (Wassily Kandinsky. Russia 1913), *Symphony of Factory Sirens* (Arseni Avraamov. USSR 1923), *Merz-Column* (Kurt Schwitters. Germany 1923), *Imaginary Landscape* (John Cage. USA 1939), *Symphonie Pour Un Homme Seul* (Pierre Schaeffer. France 1949), *Forbidden Planet Soundtrack* (Louis and Bebe Barron. USA 1956), *3 Octave* (Francois and Bernard Baschet, France 1956), *Public Supply* (Max Neuhaus. USA 1966), *Alien Bog/Beautiful Soop* (Pauline Oliveros. USA 1966), *Skydrift* (David Dunn. USA 1977), *Camera Lucida: Sonochemical Observatory* (Richard Chartier. Turkey 2009), *Wind Coil Sound Flow* (Ken Gregory. Canada 2009), *BIRDLAND* (Bruce Mowson. Australia 2009) and *Chalice Well* (Barry Truax. Canada 2009).

5.2.7. Artist-Functions, Statements and Institutions

The screenshot shows a digital interface for the work 'Hildegard Westerkamp - Soundwalking'. It features a dark background with white text. On the left, there is a table with the following data:

Year	1978	11
Location	Canada	
Worktype	Broadcast	
Materials	field recording, radio	
Info	Co-operative Radio	

Below the table is a 'PDF' link. To the right of the table, there is a list of tags: Community, Field_Recording, Transmission, Acousmatics, Soundscape, Radio, and Soundwalk. Below this is a 'Work Details' section with the following text:

Work Details
 This work in collaboration with Co-operative Radio, Vancouver (Westerkamp founded this). A broadcast of recordings from various local sites. sonic mirroring. The broadcast is opportunity for inhabitants to hear their own noise, so often unheard.

Figure 5.2d. *Soundwalking* (Westerkamp 1978) presented in *Surface*.

In *Surface*, the nodes are used to articulate the connections between **artist-functions, statements, institutions** and the **historic material conditions** of their appearance. The next section of the DVD demonstrates the nature of such connections using the by-now familiar example of Canada.



Surface: Artist-Functions and Statements in Canada

By way of illustration, and to expand upon the content of the DVD, let us look at one of Hildegard Westerkamp's statements, *Soundwalking* (Canada 1978) as presented in *Surface*. Figure 5.2d provides information as to the historical appearance of the statement, its geographical location and some indication of its nature (Work Details). It can be seen that *Soundwalking* has been related, from a primary reading of details provided by the artist herself, to a number of nodes. Some of these nodes may be short-lived in the artist-function's production over a period of time. Other nodes may be sustained over a longer period, and may become inherently associated with an artist-function, potentially limiting the range of possible utterances available to the artist-function. That Westerkamp is closely related to soundscape studies and to the practice of soundwalking is empirically grounded, yet may one speculate that at times she may have wished to produce statements of a different nature?

artists
Hildegard
Westerkamp

ID:211

nodes
Soundwalk
Soundscape
Radio
Networks
Transmission
Underground_Model
Public_Model
Community

Co-operative Radio
Radio_Station
Vancouver Canada
1973 -

Vancouver Co-operative Radio. CFRO, 102.7FM is a non-commercial, co-operatively-owned, listener-supported, community radio station. Located in the heart of Vancouver's Downtown Eastside, Co-op Radio is a voice for the voiceless that strives to provide a space for under-represented and marginalized communities. Co-op Radio aims to increase community participation by encouraging examination of the social and political concerns of the geographic and cultural communities of BC. Accessed 12.08.2009 from <http://www.cooprado.org/about/index.html>

Bibliographic Refs
Organisor
Funder Canadian Government, Canada Arts Council

Figure 5.2e. Co-Operative Radio presented in *Surface*.

Such speculations must remain just that, what we are interested in here is how a particular statement relates to a particular institution. Figure 5.2e shows how the interests of an artist-function, as embodied in a specific statement, intersect with those of an institutional entity. It should be emphasised that

80

these intersections will not necessarily be smooth, but the site of conflict, negotiation and struggle. Figures 5.2d and 5.2e show those nodes common to both statement and institution (grey), and also those nodes which are not (orange). Also to be acknowledged are the commonalities of time and place that bind statement, artist-function and institution together, facilitating a specific form of interaction, while simultaneously excluding other possibilities.

This type of analysis can be extended further, and has been explored in *Surface* within the Canadian context. Chapter 2 introduced some of the institution agendas that occurred in Canada at this time, and Figure 5.2f moves our focus to the level of funding. We can see how a statement (*Soundwalking*) that offers an “opportunity for inhabitants to hear their own noise, so often unheard” relates to the institutional agenda of *Co-Op Radio* (“[to] increase community participation by encouraging examination of the social and political concerns of the geographic and cultural communities of British Columbia”) and how this in turn would be of relevance to the political/cultural aims of central Canadian government.

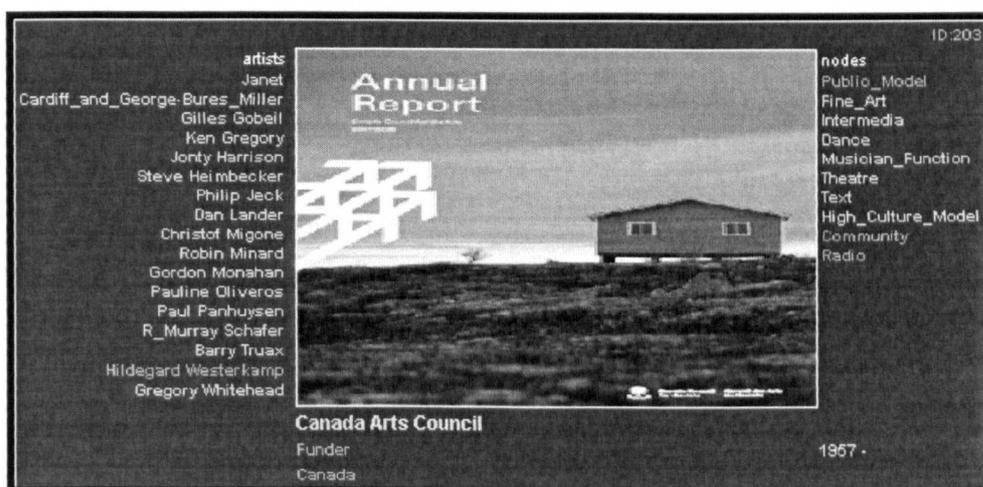


Figure 5.2f. The *Canadian Arts Council* presented in *Surface*.

It should be plain from the type of connectivities explained regarding Westerkamp’s work how an analysis engaging on the institutional level opens up alternate lines of flights through the discursive field. The Canadian example illustrates some of the methods introduced during the development of *Surface*. It must be remembered that *Surface*’s information is incomplete (contingent), and reiterate the *ImMApp*’s fundamental identity as a **framework** for exploring sound art rather than a definitively assembled encyclopaedic account.

5.2.8. Surface: A Variable Ontology

In considering the *ImMApp* schema, the variability of this ontology must be noted. Although the node classes themselves are stable, the objects contained within them are changeable. The schema simply provides a framework for the appearance of alternate positions. The *ImMApp* archive is, like all archives, contingent, yet its framework can be easily extended in any direction³⁸. Existing content can be easily modified and additional entities can be simply added. So, and this will be discussed in Chapter 7 (Limitations, Conclusions & Future Work), should *Surface* be made available as an online resource, other researchers would be able to contribute their own objects, and the ontology as a whole would shift accordingly. This facility can be seen in the final part of the first section of the DVD.



Surface: Modifying the Dataset

This DVD section uses the example of Jem Finer, and shows how a work produced by him in 2009 (*Longplayer Live*) is added to the database, and how the newly added record can be easily associated with a number of nodes.

5.2.9. Surface: Conclusions

```
<?php
mysql_select_db($database_immapp, $immapp);
$recordID = $_GET['recordID'];
$query_rs_artist_nodes = "SELECT * FROM artist_nodes

INNER JOIN artist
ON id_artist = artistID_artist_nodes
INNER JOIN nodes
ON id_node = $recordID WHERE nodeID_artist_nodes = $recordID

ORDER by year_artist ASC";

$rs_artist_nodes = mysql_query($query_rs_artist_nodes, $immapp) or die(mysql_error());
$row_rs_artist_nodes = mysql_fetch_assoc($rs_artist_nodes);
$totalRows_rs_artist_nodes = mysql_num_rows($rs_artist_nodes);
?>
```

This code encapsulates much of the activity described in this chapter. It shows how linear text is extended in the digital domain by specific functions allowed by, in this case, PHP scripting. With *Surface*

³⁸ This in fact was the case when in late 2008 I was approached by Dr. Salomé Voegelin (director of the MA Sound Arts at the London College of Communication). She was researching for a book *Listening to Noise and Silence: Toward a Philosophy of Sound Art*, to be published by Continuum Press NY in 2009. She was looking for sound pieces dealing with the particular topics of 'journeys', 'silence' and 'furniture'. Finding relevant material from the database, via *Surface*, was straightforward and I was able to give her a range of material, some of which was directly relevant, and previously unknown to her. The nodes 'journey', 'station' and 'railway' were added to the schema (furniture already existed). To support such investigation, *Surface* also facilitates a pdf output function of such data and the example of the work node 'journey' pdf is reproduced in Appendix 4 (p127). (I extend my thanks to Dr. Voegelin for her assistance in verifying and preparing this footnote).

sound art can be explored from a number of different positions in an expanded horizon of possibilities. Although contingent, restricted in important regards by technical constraints, it is the most extensive mapping of sound art undertaken to date.

The remainder of this chapter demonstrates how the methods developed in *Surface* were transformed from a 2D web application into an IDE, while Chapter 6 provides a more detailed account of the *Immersion* IDE and you are advised to explore the second section of the DVD at this time.

5.3. *Immersion*

I have introduced the 2D database of *Surface*. I want now to go beyond this into the 3D metaphorical space of *Immersion*. A working database architecture had been established, and the growing dataset, as I have shown, embodied the critical ontology of sound art. There were a number of key questions that needed to be answered regarding my conception of *Immersion*:

- How would *Immersion* connect with *Surface*?
- How could real-time interactions be enabled?
- How could *Immersion* handle the large amounts of text involved?
- How could high quality surround sound be enabled and how could this present spatialised audio?
- How could *Immersion* facilitate reliable playback of video documentation?
- How could *Immersion* be finally presented as a large format, video projection?

A number of different technologies were considered and explored to varying degrees. These included Max/MSP (<http://www.cycling74.com/products/maxmsp.html>), Adobe Flash (Reinhardt and Dowd 2002), (Lott and Reinhardt 2006), Adobe Director (<http://www.adobe.com/products/director/>), Pure Data (<http://puredata.info/>), Processing (<http://www.processing.org/>), VVVV(MESO 1998) and CPS (Gorisse 2000). After extensive evaluations the decision was made to direct research effort towards the potentials of XML, XSLT and X3D (<http://www.web3d.org/>) to deliver the key requirements of the project (as outlined above).

X3D was chosen for the following reasons:

- Open Source Development
- Real-time Interaction.
- Large Number of alternative Browsers.³⁹
- Active Support Community
- Multichannel Spatialised Sound.
- XML standard / Extensibility.⁴⁰

The combination of XML, XSLT and X3D presents a complex exploration of contemporary digital technologies, especially when considered alongside MySQL and PHP. Each separate element is expansive, each involves a complicated and specialist vocabulary and the learning curves involved were steep. While the technique of XML-XSLT-X3D has been investigated in other disciplines ((Brutzman 2001), (Neushul 2003), (Polys 2003)) the area remains almost totally unexplored within the arts. Throughout the remainder of this chapter, I will use the example of artist-functions associated with the 'Noise' node to demonstrate how the two-dimensionality of *Surface* was expanded into the three dimensions of *Immersion*.

5.3.1. HTML/PHP→ XML via XSLT: Deriving Useful Semantic Data from 'Surface'

When a node hyperlink is clicked from *Surface*'s homepage, a list of associated artist-functions is returned, with further links to an overview of each of the relevant artists (Figure 5.3a (p85)). By clicking on the XML link, PHP script is invoked that outputs only the semantic data as an XML file called, in our example, XML-NODE-Noise.xml⁴¹. This XML is linked to a relevant XSLT stylesheet, which when processed, generates the X3D environments presented in *Immersion* (BS-Contact) (Figure 5.3b (p85)).

The open source development environment *Netbeans* (Open source 2008) was used for processing the XML by XSLT. XSLT offered a neat and workable solution to the means of dynamically generating the components of *Immersion* from the *Surface* dataset and *Immersion* offers a sophisticated use of XSLT, with, for example, variable X3D geometries being created by conditional statements in the XSLT stylesheet dependant upon the content of the source XML. Appendix 6 (p129) offers a small sample of the code used in the Artist_Node XSL transformation and demonstrates how X3D is generatively derived from the data of

³⁹ I investigated the variable capabilities of each of the major X3D browsers. I refer you to my article which discusses these in more detail: Taylor (2008a) and a summary of these findings can be found in Appendix 5 (p128)

⁴⁰ Through the use of author-defined <Prototype> nodes, the functionality of X3D worlds can be extended. While outside the scope of the current project, the possibility of extending the *ImMApp* through the use of haptic interaction, Java-based audio-synthesis, and a more intuitive interface, are examples of the advantages of using an extensible language.

⁴¹ Available online in Technical Appendix 1 at <http://www.suborg.net/research.html>.

the initial XML file⁴². We can now move on to the final stage of *ImMApp* data transformation process, the presentation of the dataset in virtual space.

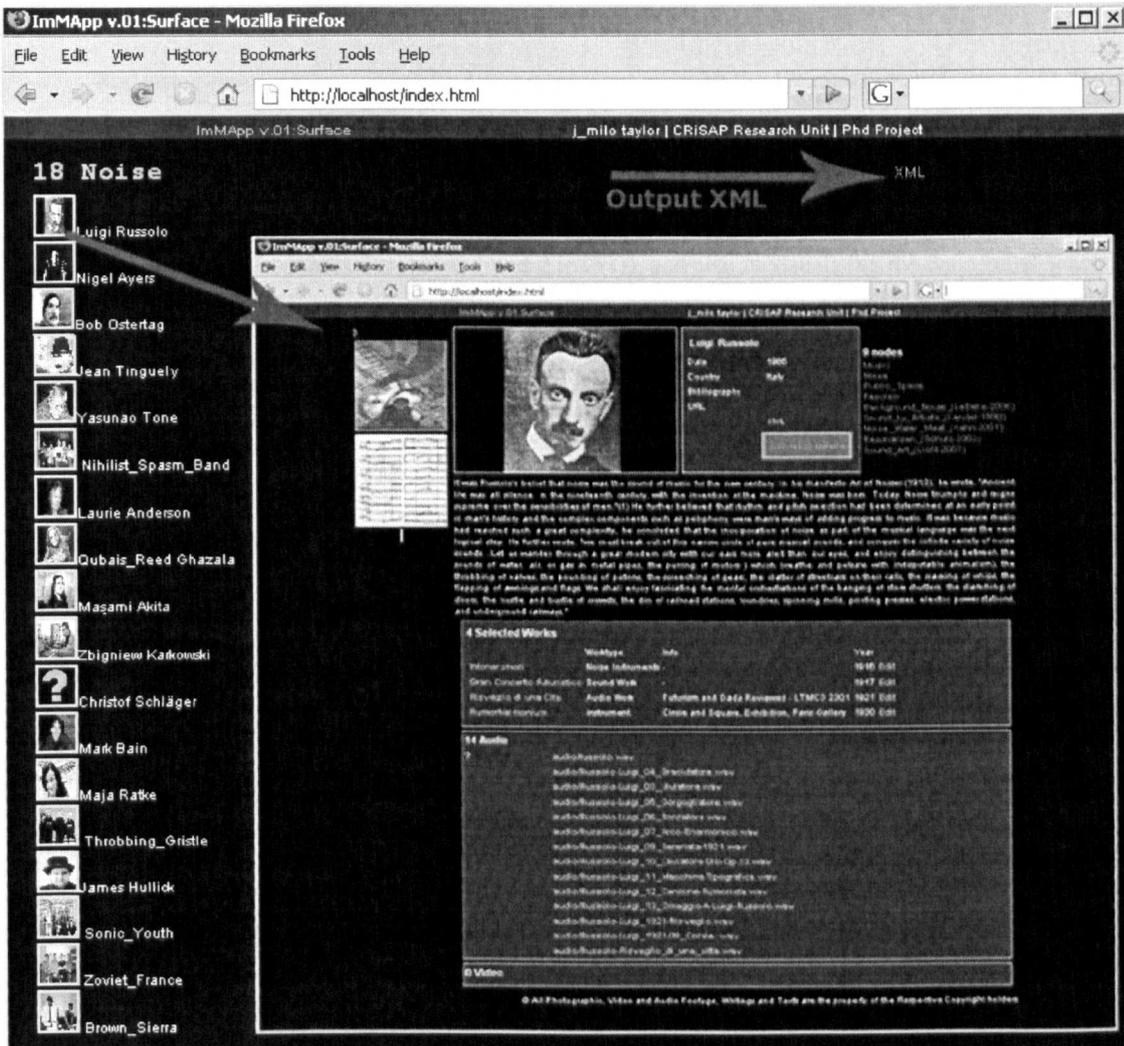


Figure 5.3a *Surface*: The 'Noise' Node and Luigi Russolo

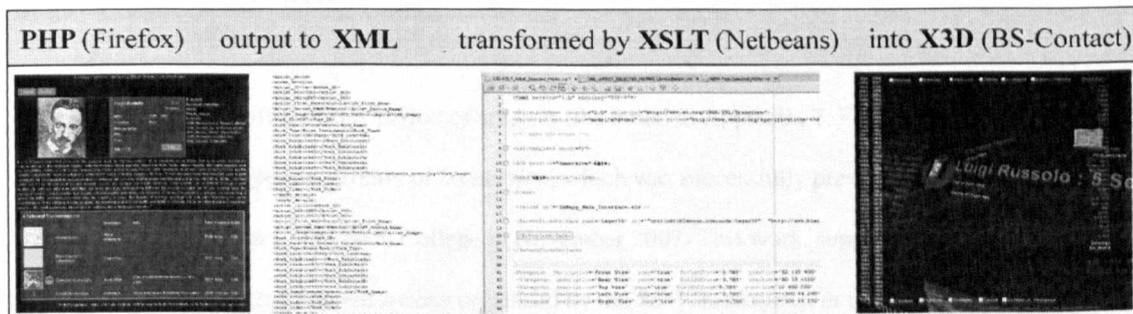


Figure 5.3b. *ImMApp* Immersion Process Diagram (PHP → XML → XSLT → X3D)

⁴² The complete stylesheet is available online in Technical Appendix 3. (<http://www.suborg.net/research.html>).

5.3.2. X3D (eXtensible 3D)

In terms of the X3D aspects of *Immersion*, there were two main areas to consider: **development** and **delivery**.

Regarding development, early effort was spent working with the *FluxStudio*⁴³ authoring tool (Parisi 2008). This open source application is modelled on typical 3D design software (e.g. *Maya*, *3D Studio Max*, *Blender*) but specifically aimed at X3D content. The graphical interface was useful to me in familiarising myself with 3D design (Appendix 7: Figures 1 and 2 (p131)), and also in visualising the conceptual space of *Immersion* (Appendix 7: Figures 3-10 (p132-135)). As the project developed, a number of limitations in *FluxStudio* became apparent, and the majority of later development was undertaken in *X3D-Edit* (Brutzman 2003) and *Netbeans*.

Prior the *ImMApp* project, my experience of 3D design had been minimal and the figures of Appendix 6 cited above document my early experiments with the medium. These were explorations of how virtual space could be used to articulate the variable proximities of various elements. In addition to this was the more specific familiarisation process with the different features of the X3D language. Initially, following the work of Brutzman and Daly (Brutzman and Daly 2007), *FluxStudio* was used to explore :

- Scene Graphs
- Camera Viewpoints and Navigation
- Event Animation and Interpolation
- Event Utilities and Scripting
- Touch and Proximity Sensors
- Prototype Nodes
- Grouping Nodes
- Geometries and Textures
- User Interactivity
- Lighting and Environment
- Audio Spatialisation

The positive effect of this period of study is illustrated in Appendix 7: Figures 11-14 (pgs137-138) which document a mid-period version of *Immersion*, which was successfully presented at the *Digital Archive Fever Conference*, Birkbeck College in November 2007. This work, supported by an essay, was short-listed for the *3DVisA Student Award* organised by the *3D Visualisation in the Arts Network* (3DVisA).

⁴³ During the research period Media Machines' *FluxStudio*, and *FluxPlayer* were rebranded as *Vivaty Studio* and *Player* following the injection of venture capital and a deal made with the social networking site *Facebook* and *AOL Instant Messenger* (AIM). The intention behind this is to lever X3D content into a consumer-focused platform enjoying widespread use.

Alongside this development, I was also exploring the means to finally present *Immersion*, which would feature images, video, and most problematically, in terms of **delivery**, large amounts of text and audio (the latter of which to be presented in a multichannel speaker format). This resulted in an extended period of research into the various X3D browsers and the relative degree of support provided by each. Detailed coverage of the X3D specifications are found online (<http://www.web3d.org/>) and in a growing body of literature (Geroimenko and Chen 2005), (Brutzman and Daly 2007).

Of the X3D browsers, *BS-Contact* is one of the most advanced. The developer (*Bitmanagement*) is centrally placed in the X3D community and the browser is used in a wide variety of applications throughout the world. Uses range from a 3D World Atlas visualisation application (*Bertelsmann*), mobile augmented reality systems (*T-Systems* and *German Telecom*), E-shopping (*Siemens*), visualisations of urban-planning (*WS Atkins*), aeronautics (*German Aerospace Centre*), archaeological reconstruction (*InnovaTecno*), electrical engineering, industrial process visualisation, military simulation and product/systems design. Crucially for the *ImMApp* project, *BS-Contact* supports rendering of a large amounts of text (something found problematic in *FluxPlayer*) and provides immersive audio capabilities via the *Microsoft DirectSound* software component of the *DirectX* library when used with a WDM driver-compatible sound card. In addition to these key capabilities, *BS-Contact* gains from its set of VRML/X3D node extensions. These allow the core X3D specifications required for all compliant browsers to be augmented by the efforts of particular developers. In the case of *Bitmanagement*, their work has greatly expanded the possibilities for X3D environments, and the use of their extended library is evident throughout *Immersion*.

5.4. Chapter 5: Conclusions

From the project's beginnings a sound art archive was assembled from a wide range of relevant sources and this material was entered into an evolving database architecture (MySQL). A first iteration of the *ImMApp* project was undertaken which involved a web-database application (*Surface*). This allowed the researcher to explore the first grouping of core technologies (MySQL, PHP, XML) and *Surface* was an essential aspect of the research process. The dataset needs to be understood as incomplete, and this observation refers to the question raised in Chapter 2 regarding the scope of data-gathering under the guidelines outlined by Rose's discussion of **Discourse Analysis I**.

The number of possible entries in the database is potentially without end, and throughout the project there was constant expansion. This expansion of primary content also implied the additional inputting of contextualising node data. There are opaque issues surrounding the assumption that what was found while gathering data (online, books, exhibition catalogues etc.) can be considered as 'empirically grounded'. While I discount the possibility that the material presented will be deliberately misleading, I also entertain the likelihood that it is in the best interests of those involved (artist-functions, curator-functions, institutions etc.) to distribute material most complementary to themselves, their statements and their wider agendas. I also acknowledge that the documentation of sound art is difficult and can often elude any form of reproduction outside of its primary context. For these reasons, the *ImMApp* cannot be considered as empirical, but is better described as digitally enabled/limited. The claims made for the *ImMApp* do not rest upon notions of truth, but rather how the methodology provides an alternate reconstruction of social practices (sound art), considered in relation to the pre-existing resources discussed in Chapters 3 and 4.

Surface facilitated the serialisation of the database material into distinct XML files. These were then subjected to XSL transformations via *Netbeans*. This was an important aspect of the work, and one unexplored within the arts disciplines. In this case, the XML is transformed into X3D, and this code, opened from within an appropriate X3D browser, places the user inside an IDE called *Immersion*.

I have clarified these key aspects of the practice-based enquiry undertaken in the *ImMApp* project. Early results showed that this methodology articulated something of the great diversity of sound art while avoiding the reiteration of a reified view of sound art. I consider the development of this methodology as central to the themes of immersion, with the requirements of the final application determining my own, unframed, immersion within sound art.

Chapter 6. Sound Art within *Immersion*

This chapter provides an account of sound art from within the *Immersion* IDE. It evaluates how *Immersion* has folded Foucault's archaeological method into contemporary digital practice and assesses the re-evaluation of sound art that this has generated. The chapter is in three main parts; the first section (6.1) revisits Foucault, and I demonstrate how the theoretical framework outlined in Chapter 2 is articulated. The second section (6.2) probes into the *Immersion* environment and discusses its re-presentation of the 'water' node as initiated by Kahn. The final section (6.3) looks at the potential of a minor history of sound art and following this, a short conclusion points towards the final chapter.

I showed in Chapter 2 how the key aspect of Foucauldian method is to chart the relation between the visible (things) and the sayable (words). That is to say, to focus on those sets of statements and arrangements that make up sound art, and to recognise this historical contingency as productive in the ongoing formation of the archive. Chapter 3 explored the nature of the pre-existing archive of sound art discourse as embodied in the texts of Lander, Kahn and LaBelle and I explored how such discourse was influenced by both discursive and material constraints. Chapter 4 expanded the survey of sound art discourse through a review of two online projects, the *Australian Sound Design Project* and *soundtoys.net* and through reference to the theorisations of McLuhan, Manovich and Kittler expanded the Foucauldian notions of discourse and the archive to considerations of how available information technologies affect the range of cognitive processes available to subjectivities. Knowledge affordances are differential and plainly contribute to the nature of the ongoing formation of the archive. Chapter 5 discussed how Foucault's ideas contributed to the development of *Surface* and enabled the development of a critical ontology of sound art (Figure 5.2b (p75) and the first section of the DVD). With these established, I can now attend to how this assemblage of knowledge is presented within *Immersion* and I suggest that this section of the thesis is read alongside a viewing of the second section of the DVD⁴⁴.



Immersion: Ontology and Overview

⁴⁴ A few comments on the nature of this second section of the DVD need to be made at this juncture. The menu that begins this section offers you the kind of non-linear exploration of the dataset as afforded an immersant in the actual IDE, although the interaction here is of a limited kind. It is suggested that upon first viewing you begin from the 'Ontology and Overview' link. The presentation will then play out in a linear fashion in one possible ordering of the material. Upon a second viewing, you are encouraged to explore the content in a non-linear fashion, using the interactive menu, thereby gaining some sense of the possible reconfigurations and recontextualisations of the dataset experienced in a digital drift through *Immersion*.

The entryway to sound art provided by *Immersion* appears initially as an isolated element (Figure 6a.). This point represents the single most important hierarchy in *Immersion*: the dependence of all that follows upon the immersive database and the formatting of information rendered legitimate in such a medium.

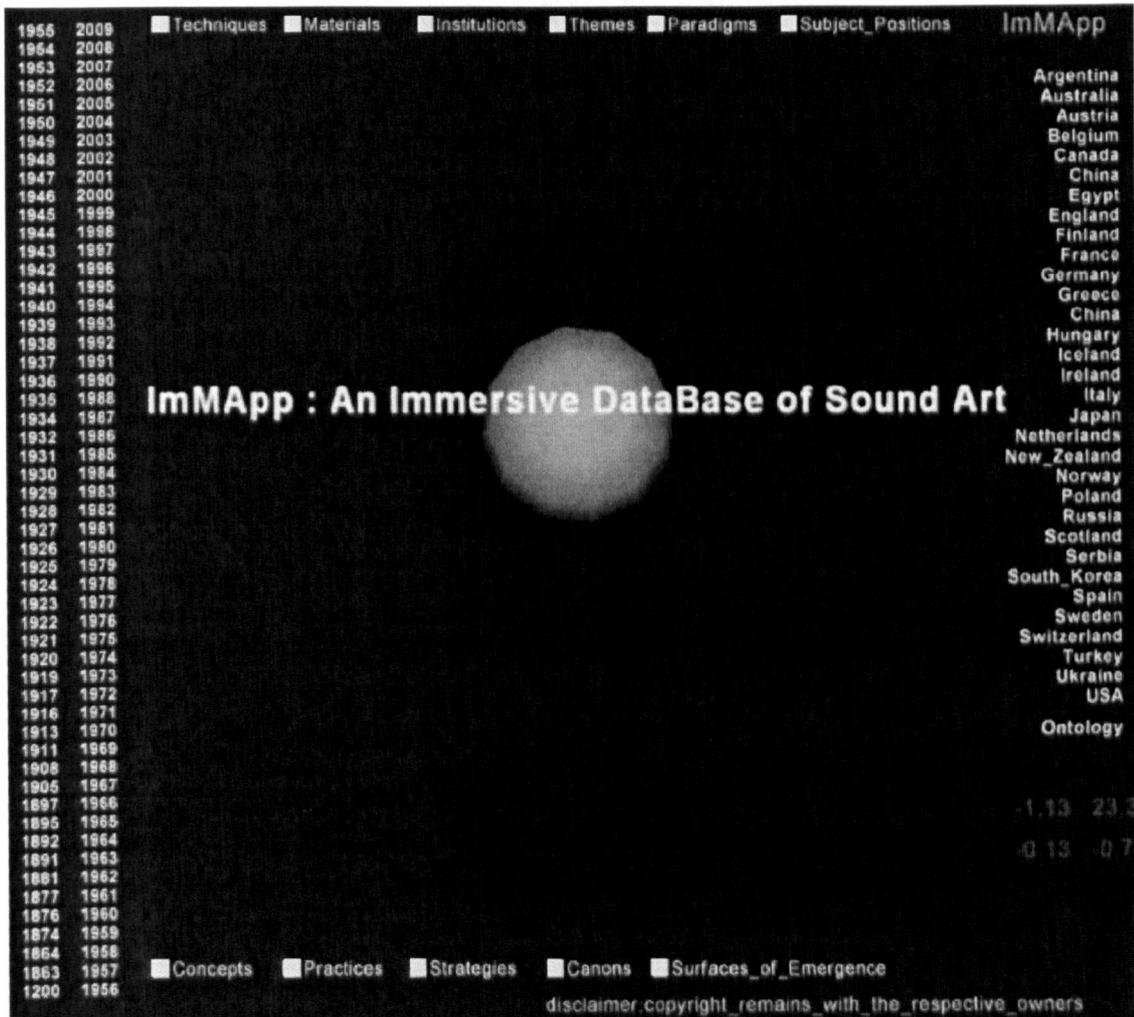


Figure 6a. *Immersion*: Entry POV

The primary interface provided by *Immersion*, a singularity, once clicked upon, expands into a multiplicity, revealing a rhizomatic structuring of the node classes established by *Surface* (i.e. Subject Positions, Themes, Techniques, Paradigms and so on). Once any of these class elements are clicked, the child nodes related to that class are revealed. (Figure 6b. (p91))⁴⁵. Each of these node classes is spatially sonified with a soundwork selected from the dataset⁴⁶.

⁴⁵ This primary interface is a modification of existing code from the early history of VRML. Thanks to Bob Crispen <http://home.hiwaay.net/~crispen/>

⁴⁶ A full listing of works referenced in the DVD can be found in Appendix 8.

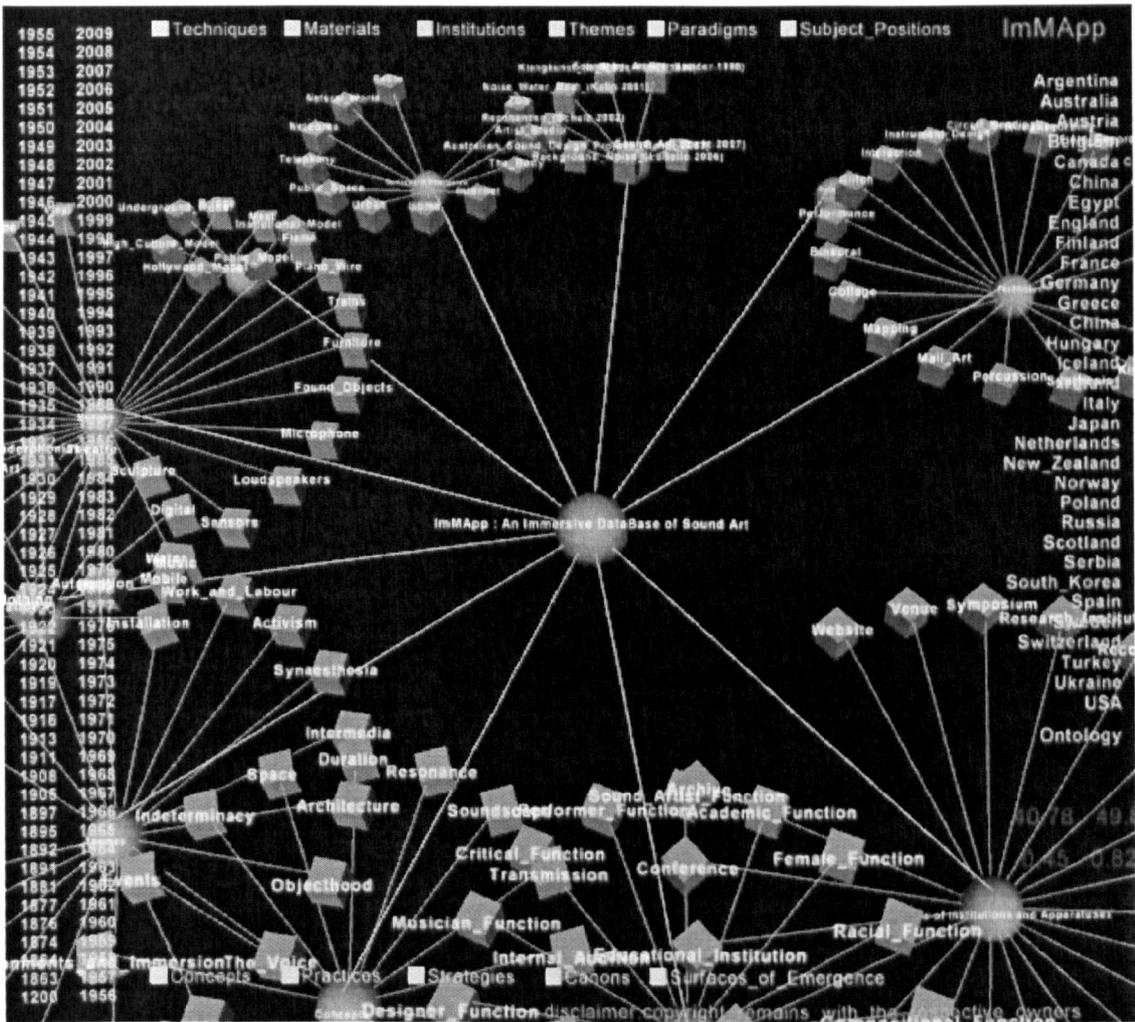


Figure 6b. *Immersion*: Node Classes

Simultaneous to the multiplicities populating the centre of the screen is a transparent, interactive HUD layer (Head-Up Display) which is always available. This contains objects linking to years, countries and node classes. The intention is to connect every part of the environment with every other, thereby allowing multi-linear rhizomatic exploration. This facility deconstructs the aggregated nodal clusters, providing lines of flight into other areas which might not otherwise be within reach. In this way an alternate genealogical or geographical exploration is always possible, regardless of the current context of exploration. Both genealogical and geographical explorations are facilitated on the DVD:



Immersion: Genealogy: 2009: 2002: 1994: 1984: 1977.



Immersion: Geography: England: Australia.

Returning to the centre of the screen, an immersant may select a node and be transported into an immersive assemblage of artist-functions related to that node.

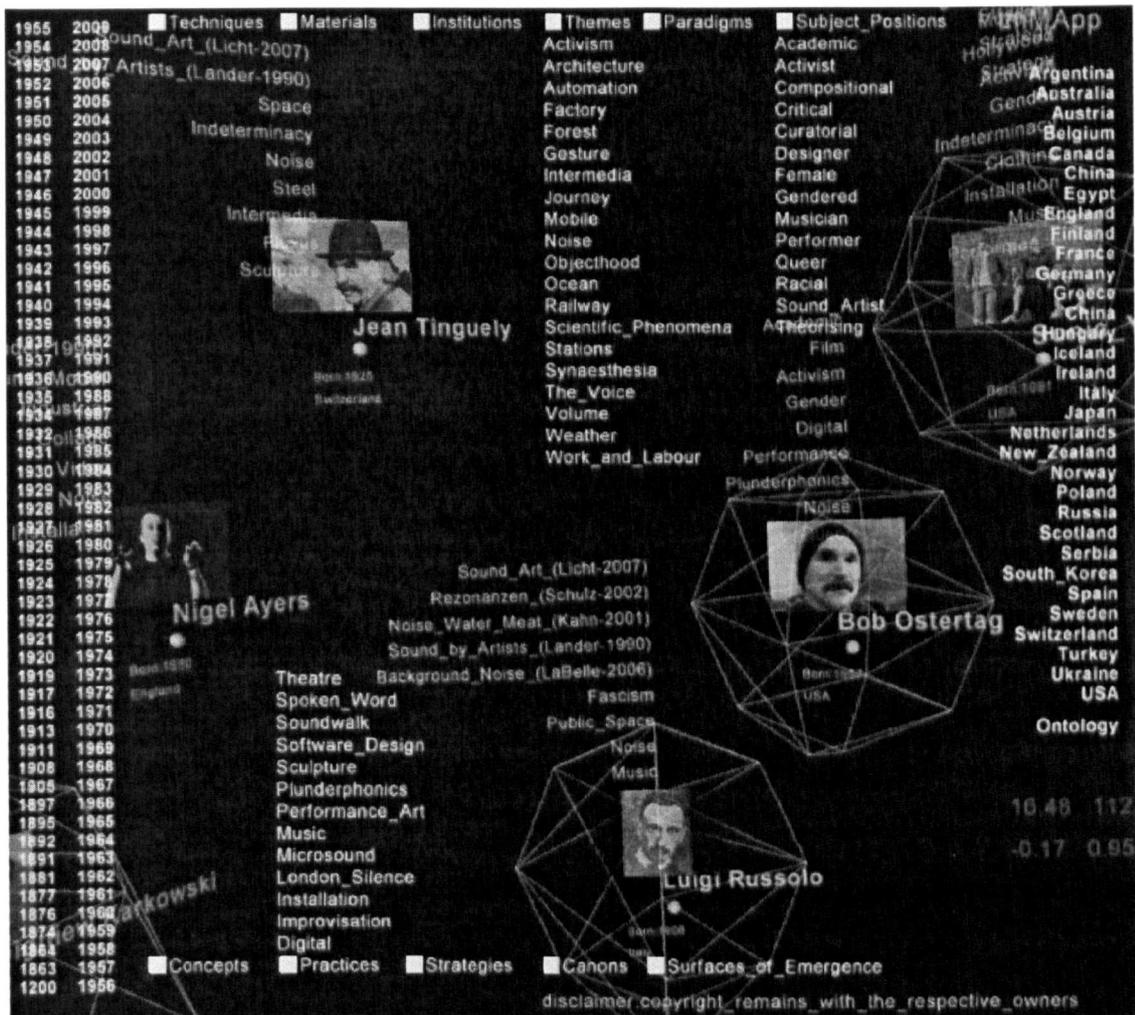


Figure 6c. Immersion: Noise Node



Immersion: Nodes: Noise

Figure 6c. shows such an assemblage, in this case, generated around the ‘Noise’ node. Here an immersant experiences a spatialised collage of sounds providing auditory cues to the sonic content of practice surrounding this node object. Each element in the assemblage is also interactive, so in this example, the ‘noise’ node assemblage is linked to further scenes defined by the array of nodes associated with artist-functions, an artist-function’s selected statements, year of birth, or country of birth.

The linkages, and hence the relationships between entities thus explored by the *ImMApp* are multidimensional and flattened. There is no hierarchy between node classes: an artist-function's relation to a paradigm for example, is not considered more important than their relation to a material, technique, or canon. Each node class has potentially influenced actual practice, and it is the specific connections between these classes, this contingent convergence of external forces and creative subjectivities, which defines an artist-function within the *Immersion* environment.

We may also wish to see how such nodes pass through and between entities. So this example, 'Noise', is shared by a number of artist-functions. However, such a theme may also be associated with specific statements and specific institutions, and the historical and geographical circulation of node objects between such ruptured domains of analysis (subjectivity-statement-institution) is the essential view of sound art from within *Immersion*.

There are of course a variety of other routes that might have been taken in this example, all of which embody the underlying ontological schema of the *ImMApp*. An assemblage of artist-functions working with 'Radio' is available on the DVD.



Immersion: Nodes: Radio

6.1. Foucault's Archaeological Method Revisited

What follows are a number of observations relating to the theoretical approach established in Chapter 2. I will outline some areas of sound art illuminated by this Foucauldian-derived methodology, and I suggest that we may wish to consider these findings in contrast to the resources discussed in Chapters 3 and 4. I will turn to a number of points that need to be addressed in order to deliver successfully a mapping of sound art as informed by this archaeological perspective.

The first step we need to take is to recognise a discourse as a corpus of statements which are organised **regularly and systematically**.

From the position of the previously discussed resources (Lander, Kahn and Labelle) it may seem that the statements constituting sound art elude such a definition, and therefore that sound art cannot be approached as a discourse at all. The regulatory and systematicising aspects of practice, which occur in the exchanges between subjectivities, statements and institutions, are denied by Lander, Kahn and Labelle. In contrast, the *ImMApp* alternatively illuminates practice and shows how sound art can be critically addressed by treating the domain as if it were a discursive phenomenon as defined by Foucault. Neither the overtly performative voice of Kahn, nor the unilinear analysis of LaBelle provides any richer conclusions beyond the closed box of interpretive readings of statements and artists' oeuvres. Their conclusions are restricted both by their subjective positioning within the discursive field, and their choice of information technology. In contrast to this, the unprecedented data gathering undertaken during the *ImMApp* research shows sound art to be, in actuality, both regular and systematic, and therefore a discursive phenomenon. Sound art has then become defined and made systematic by a number of material and discursive factors. By way of illustration we may note a number of features of sound art articulated by the *ImMApp* dataset:

- The continued and repeated circulation of a number of core artist-functions (e.g. Christina Kubisch, Christian Marclay, Bernhard Leitner, Scanner) within an internationalised circuit of festivals, exhibitions, conferences, symposiums and so on (**apparatuses**).
- The numerous examples of iterative series of exhibitions and festivals: For example:
 - i. *Audio by Artists Festival*, Halifax, Canada (1984, 1985, 1986).
 - ii. *Sonambiente Festival*, Berlin, Germany (1996, 2006) (Wahjudi 2006), (Cox 2006).
 - iii. *Sign Waves/Sound Travels* series, Toronto, Canada (1998, 2000, 2002, 2003, 2004, 2005, 2006, 2007, 2008).
- Through time there has been a geographical expansion of such a circuit. Early practice generally occurred in the USA, Western Europe, Australasia and Japan. Since the late 1990's practice has become visible outside these historical centres in such locations as Brazil (*Emocao Art.ficial* 2002), China (*MAAP* 2002), Mexico (*Festival Arte Sonoro* 2000, *Sound Oasis* 2005), Azerbaijan (*Aluminum Festival*, Baku 2003) and Senegal (*DakArt Biennale* 2004).

- The presentation and representation of certain statements in a number of different contexts (**repeatability**). Examples would include Gordon Monahan's Aeolian pieces, Ed Osborn's sound installations and Andreas Oldorp's flame-organ works.
- The existence of key **surfaces of emergence**. Here we may consider sound-specific presentation spaces (*Gallery René Block, Gallery Rachel Haferkamp, Singhurlorgallerie*, (Germany), *Het Apollhuis*, (Netherlands), *Studio 5 Beekman*, (USA)), specialist radio stations (*ORF Kunstradio* (Austria), *Co-Operative Radio* (Canada), *New American Radio*, (USA)) *Resonance FM* (England), and research institutes (*GRM, IRCAM* (France), *STEIM* (Netherlands), *WDR Studio for Electronic Music* (Germany)).

In considering these elements, we should think of the various **discursive mechanisms** involved. Formal and informal discussions, electronic correspondences, letters, invitations, payment of fees, rental agreements, catalogue publications, technical requirements, health and safety considerations, promotional material, press releases, the activities of the artists and the artworks themselves. We can recognise the domain of sound art by the operation of the particular forms of calculation and recognition that organise the spaces in which the objects of sound art appear. There is nothing deeper behind this discursive surface and no subject has access to a non-discursive deeper realm. The systematic nature of the **techniques, procedures and apparatuses** in these examples demonstrates how sound art shows itself to constitute a discourse.

Exhibition Name	Location	Year
<i>Art by Telephone</i>	<i>Museum of Contemporary Art, Chicago, USA.</i>	1969
<i>Sound Sculpture</i>	<i>Vancouver Art Gallery, Vancouver, Canada.</i>	1975
<i>Sehen um zu Hören</i> (Harten 1975)	<i>Düsseldorf Stadtische Kunsthalle, Düsseldorf, Germany</i>	1975
<i>The Record as Artwork from Futurism to Conceptual Art</i>	<i>Museum of Contemporary Art, Chicago, USA.</i>	1977
<i>Sound</i>	<i>Los Angeles Institute of Contemporary Art, USA.</i>	1979
<i>Für Augen und Ohren</i> (Duttman and Eckhardt 1980)	<i>Akademie der Künste, Berlin, Germany.</i>	1980
<i>Soundings</i> (Delehanty 1980; Ashton 1981), (Ashton 1981), (Frank 1982)	<i>State University of New York, New York, USA.</i>	1981

Table 6.1. Locations of Early Sound Art Exhibitions

The second step we need to take is to identify the rules governing the production of statements. If we were to say that sound art emerged from the mid 1970's onwards, that is to say that this discourse has been produced since that time. We need to highlight the public aspects that govern the rules of formation. If we take as an example the exhibitions that presented soundworks at this time, we see that they are closely related to such major art institutions as the *Chicago Museum of Contemporary Art*, *Vancouver Art Gallery* and *Düsseldorf Stadtische Kunsthalle* (Table 6.1).

What this example suggests is that a detailed study of these exhibitions is necessary to satisfy this aspect of Foucauldian method. We would need to gain access to these records and analyse the relations and exchanges between subjectivities, statements and institutional intentions and this analysis should extend towards the funding bodies upon whose support the art institutions depend. Throughout Foucauldian treatments of discourse there is the assertion of the inseparability of thought and materiality. This assertion ensures that knowledge is understood as material practice with clear and public conditions of operation. The *ImMApp* engages with such notions and recognises the influence of fine art institutions as an important factor in enabling and limiting the appearance of legitimate statements in the archive.

Knowledge is not reducible to thoughts, opinions and ideas, but needs to be considered as a combination of discourse and materiality. By thinking in this way, **practice**, which might otherwise be treated as a transparent activity, distinguishable from non-material thinking, is recognised as a complex and specific mixture of both **material action and discourse**. Nothing is hidden, and there is nothing deeper behind discourse. *Immersion* presents sound art as a number of dynamic and interrelated elements, described in part by historical and geographical placement, and further articulated through a shifting array of nodes. It avoids the over-coding found if deterministically entering the field from one position or another, and the use of digital media has been central in this reformulation of sound art. This will be demonstrated by an evaluation of *Immersion*'s presentation of sound art statements relating to 'water' and this is contrasted with Kahn's treatment of the same node (Kahn 2001).

6.2. Water InfoClash: *Immersion* vs. Kahn

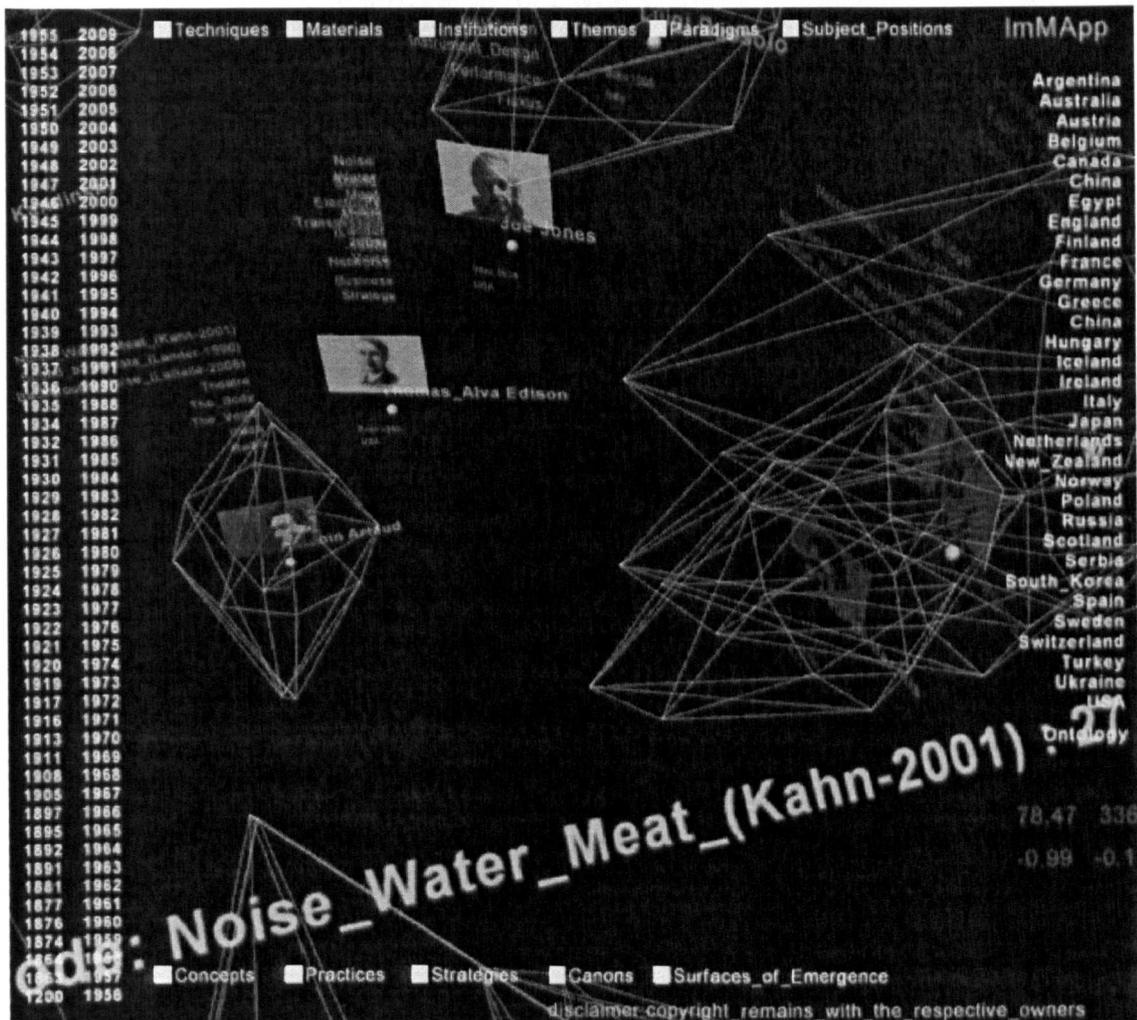


Figure 6.2a. *Noise, Water, Meat* (Kahn 2001) Re-presented in *Immersion*.

If we recall, the second section of Kahn’s book attempts “a short art history of water sound” and situates this in the earlier art musics of Satie, Wagner and Cowell, tape compositions by Le Caine and Takemitsu and particular artworks by Schwitters, Duchamp and Dali. Kahn dedicates the majority of the section to a discussion of John Cage and Jackson Pollock and relates this to broader tendencies within the Fluxus movement. Some material for this section is derived from a previously published article (Taylor 2007b)⁴⁷.

⁴⁷ Available on my website: [http://www.suborg.net/pdfs/Taylor_\(2007-\)-IMMAPP-A_Digital_Application_for_Immersive_Interaction_with_Sound%20Art_Archives_\(CCMR07\).pdf](http://www.suborg.net/pdfs/Taylor_(2007-)-IMMAPP-A_Digital_Application_for_Immersive_Interaction_with_Sound%20Art_Archives_(CCMR07).pdf). With kind permission of Springer Verlag.

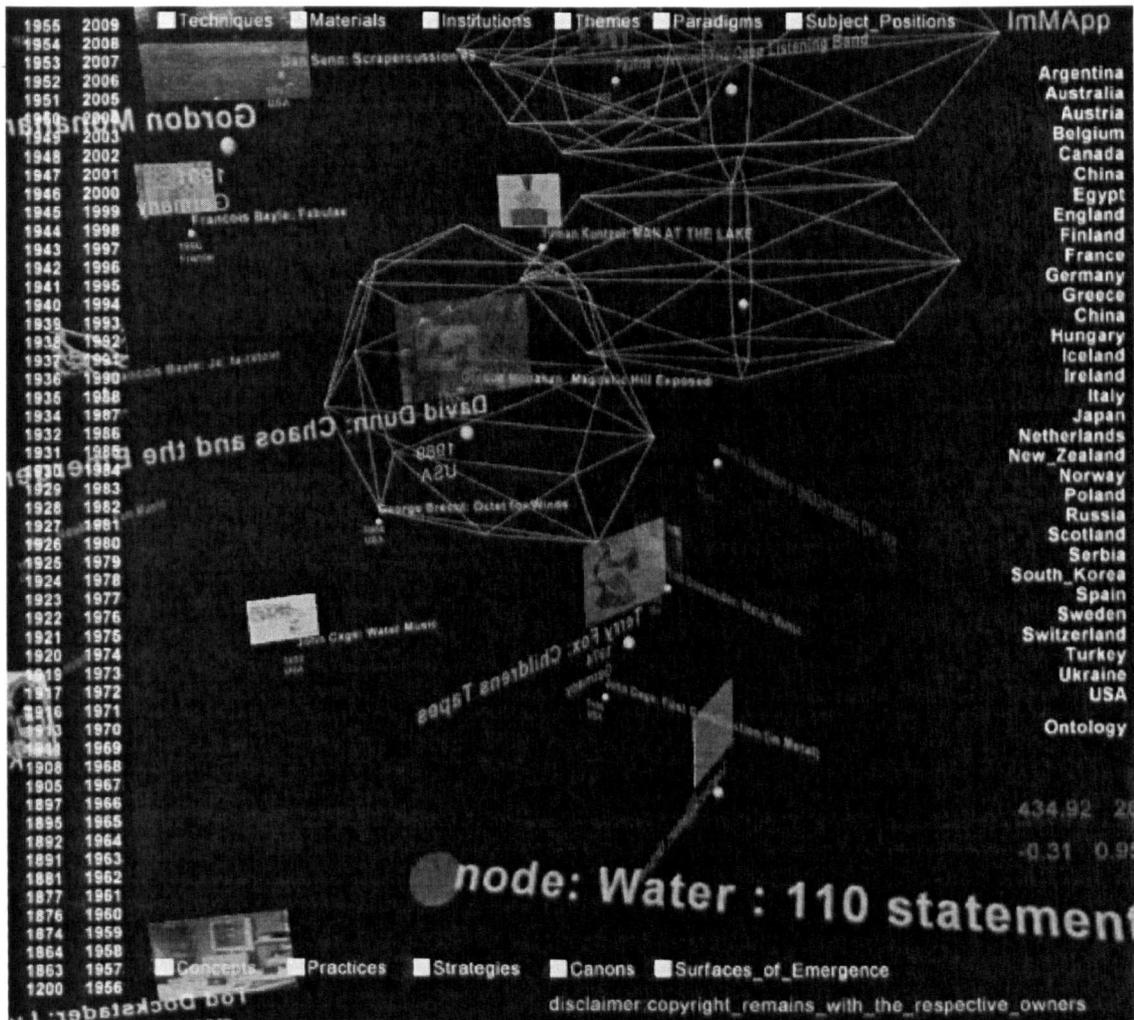


Figure 6.2b. The *Immersion* 'Water' Node.



Immersion: Nodes: Water

I will now compare the scope of this discursive field with that articulated by *Immersion*. In response to the query 'water', 110 statements are found, covering a period from 1939 to 2009. The earliest is Cage's *First Construction (in Metal)* (USA, 1939) and the most current is an unrealised installation *The Breakwater Organ* by Andreas Oldorp (Wales, 2009). The discursive space articulated by *Immersion* includes such statements as George Brecht's *Drip Music* (USA, 1959) and *Octet for Strings* (USA, 1964), Tod Dockstader's tape composition *Water Music* (USA, 1963), Jean Tinguely's *Le Cyclop* (France, 1970), David Dunn's *Chaos and the Emergent Mind of the Pond* (USA 1989), Trimpin's *Liquid Percussion* (USA, 1991), Dan Senn's *Water-driven Canopy Lyre* (USA, 1997) and Joyce Hinterding's *House 2 – The Great Artesian Basin* (Australia, 2003).

It may be unclear that these statements relate to water, yet each of them uses it integrally and differentially. So for example *First Construction (in Metal)* makes use of a water gong, and *Octet for Strings* places a toy boat in a large pan of water between two groups of performers. The performers (wind musicians) blow their instruments at the boat and try to push it towards the other group. The piece ends when the boat reaches one side of the pan.

What these two examples demonstrate is that while we are addressing one particular node (water), each statement is also clearly related to a number of other nodes ('music', 'metal', 'wind', 'Fluxus', 'event' and so on). It is the specific combination of associated nodes that defines the statement within *Immersion*, rather than a statement's particular relation to a single node considered in isolation.

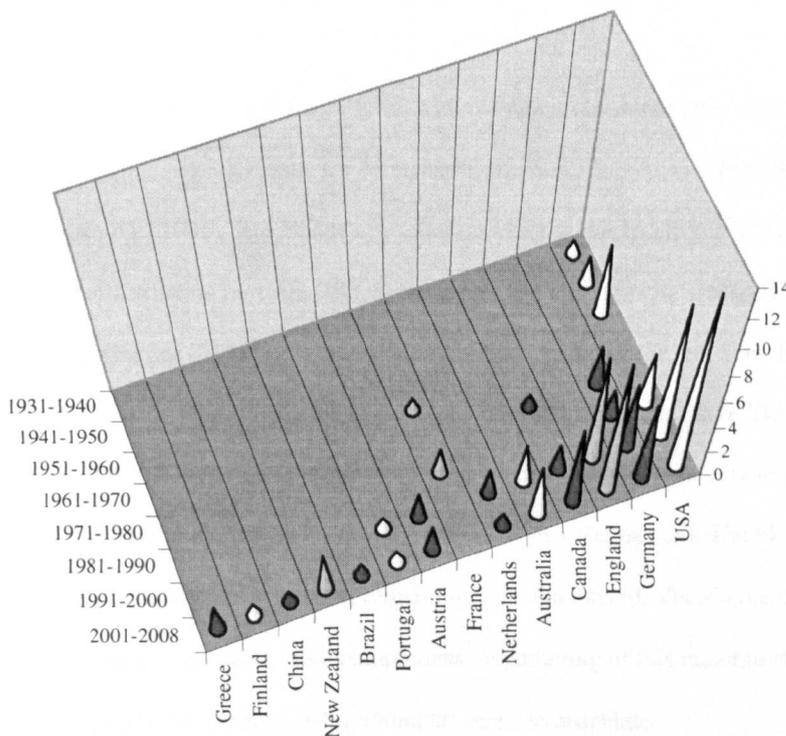


Figure 6.2c. Genealogical and Geographic distribution of Selected Statements (Water node)

Immersion also extends the geographical scope of watery sound art as introduced by Kahn. Figure 6.2c shows the type of conclusions uncovered. This graph shows the historical loci of water-based sound art statements, most clearly the USA (returning works from the 1930's onwards), Germany, Canada and France (all of which return artworks from the early 1960's onwards).

There are two further points to note here. Firstly, there is a clear geographical expansion in production from 1991 onwards (England, Australia, Netherlands, Austria, Portugal), and secondly that there has been a further expansion since the turn of the millennium (Brazil, New Zealand, China, Finland, Greece). It would be inappropriate to provide explanations for this (from a Foucauldian position), we only need to describe this as the case.

An alternative reading of 'water' from *Immersion* focuses on the institutions associated with production. These range from the *Cornish School of the Arts* in Seattle, where Cage's *First Construction (in Metal)* was premiered, to *WDR* in Cologne, the *Academy of Fine Arts*, Hamburg, *BBC's Music Live 95* Festival, Canadian record label *Empreintes DIGITales*, the *Dia Art Foundation*, New York, and the prestigious Austrian festival *Kunst in der Stadt*.

We may compare such major hosts with the numerous minor sites such as *Mount Allison University*, New Brunswick (venue for Monahan's *Magnetic Hill Exposed* (1979)), the *Mildura Arts Festival* (Australia (1996), Ros Bandt's installation *Voicing the Murray*) the *Ought-One-Festival* (Vermont (1998), host of Karlheinz Essl's *fLOW*), to such personal and intimate settings as tiny alternative spaces and artists' homes (*Brown Sierra tea*, *Gallery/flat*, *Wellington Buildings*, 9th Sept-19 Sept 1999). The range, diversity, and relative obscurity of many of these minor institutions is plain. This implies the archive of sound art (and here I mean, all possible statements made at particular historical junctures, not just those statements included in the *ImMApp* dataset) remains highly fragmented. The likelihood is that there is a large amount of unknown material still remaining to be uncovered. The source-orientated method I have used, suggests that only once a more comprehensive gathering of this material is made would one be able to say, with any degree of certainty, what sound art seeks to articulate.

This comparative exercise also reinforces the earlier conception of sound art as a polyvalent. The 'water' node contains a great diversity of practices, materials, techniques and paradigms which range from experimental musical compositions (Dallas Simpson's *Water Power* (England 2005)), acousmatic works (Denis Smalley's *Sources/scènes* (England 2000)), sound sculptures (Jean Tinguely's *Le Cyclop* (France 1970), site-specific installations (Jem Finer's *Score for a Hole in the Ground* (England 2005)), intermedia works (Terry Fox's audio art/video series *Children's Tapes* (Germany 1974)), kinetic sound objects (Sam

Aunger's *Water Harp* (1995)), software environments (Karlheinz Essl's *fLOW* (USA 1998)), field recordings (Chris Watson's *Weather Report* (England 2003)), soundwalks (Janet Cardiff and George Bures Miller's *Words Drawn in Water* (USA 2005)) and performances (Pamela Z's *Metal/Vox/Water* (USA 2005)).

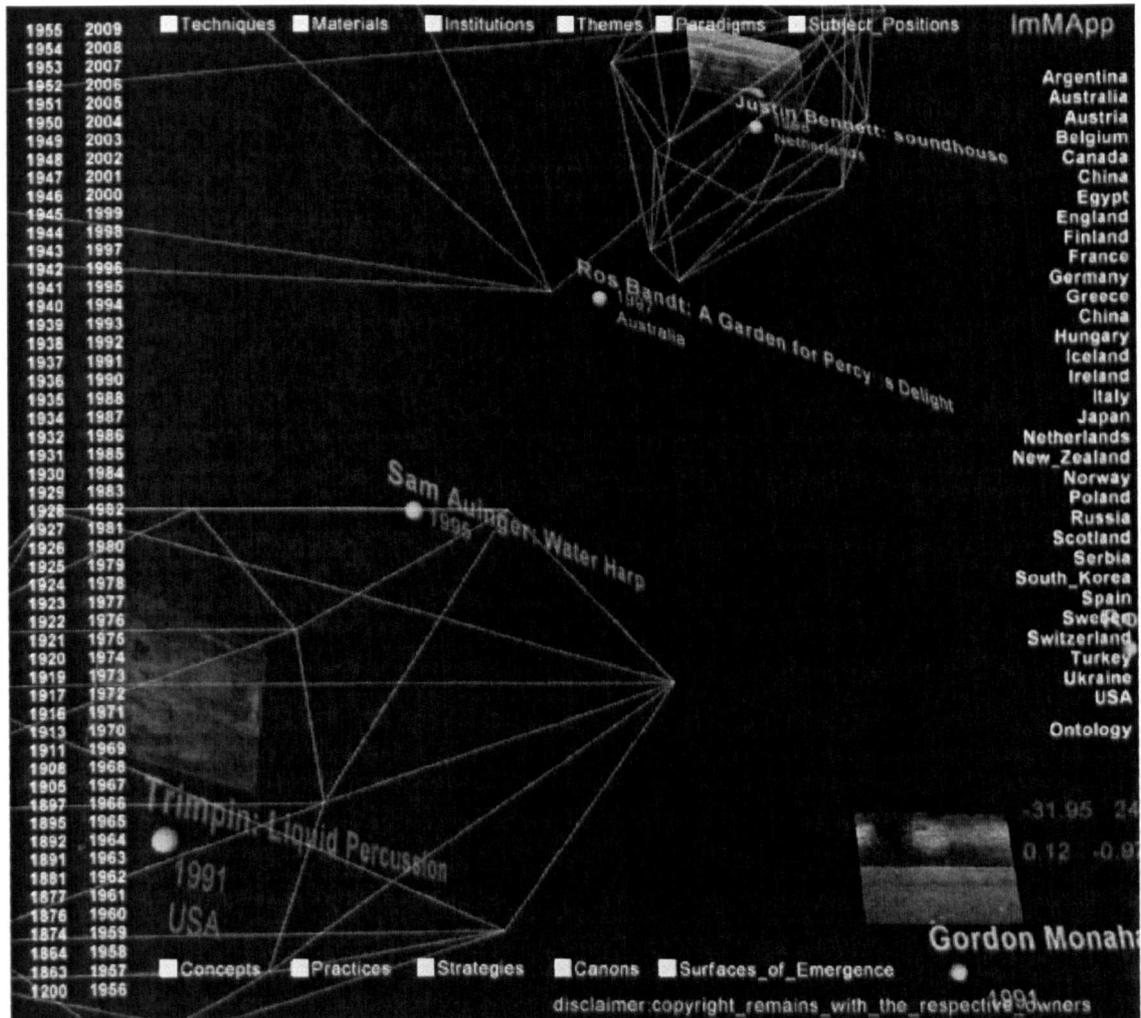


Figure 6.2d. Exploring the 'Water' Node in *Immersion*

Finally, to acknowledge the work of Kahn, this exercise provides some vindication for his idiosyncratic structuring of sound in the arts. While his work connects creative practice to deeper cultural and philosophical debates occurring in modernity and pre-modernity, the *ImMApp* extends such a method and connects historically and geographically dispersed elements that Kahn's conventional print-based analysis has overlooked, fixated as he is upon a small subset of the possible variables involved in auditory practice.

It should be clear that the ‘water’ example is only one possible focus for the analysis of historical sound art. *Immersion* is also able to articulate comparable discussion on any of the node objects contained within the database. We could also consider ‘noise’, ‘meat’ or any aspect of the node classes. A constructive comparison could be between the production of ‘noise’ with ‘water’, or between ‘water’ and ‘meat’, or between ‘water’ and ‘metal’. Such extrapolations, must however, occur outside the current work and to close this chapter, I will turn our attention to the ‘minor’ node in *Immersion*.

6.3. A Minor History of Sound Art

“[the minor] is not the qualitatively or quantitatively inferior, but what is marked by an irreducible or uncontainable difference. It is not a subcategory or subsystem in a conventional sense, but what Deleuze and Guattari term at one point an ‘out-system’ (*hors-système*).” (Joseph 2008)



Figure 6.3. The ‘Minor’ Node of *Immersion*

The construction of this minor assemblage of sound art practitioners is a new, novel, and unexpected outcome of the *ImMApp* project (Figure 6.3.). While based in Deleuze and Guattari's treatment of Kafka, the notion became applicable to the current field of research through the use of immersive digital technologies. Some indication of the numerical significance of the minor is given by a comparison of the number of practitioners associated with this cluster (75 artists) within *Immersion* in comparison to other nodes (e.g. installation (82 artists), music (74 artists), radio (21 artists)). Referring to these figures, it would be possible to argue that the most significant node within *Immersion* is this, the minor. This would mean that the defining characteristic of sound art from the position of *Immersion* is not the practice's engagement with space, or its relation to the social body, or to digital technologies, but rather its **unmapped and unknown** properties. It has only been through the application of the practice-based methodology used throughout this project that such a conclusion may be convincingly presented.



Immersion: Nodes: Minor

While, it must be said, that the criteria for inclusion in the *hors-système* is relatively arbitrary (i.e. excluded from the main body, index, bibliography and discography sections of the major canonical texts), a closer study of the artist-functions found in this grouping will demonstrate some cursory observations on the 'irreducible' and 'uncontainable' differences embodied by the practices of these practitioners.

The most historically distant artist-function found here is Halim El-Dabh, whose *Wire Recorder Piece* (1944), featuring the processing of recorded sounds, predates Pierre Schaeffer's more formal explorations of decontextualised sound objects and later invention of *musique concrète* by a few years. It is not to search for an unknowable origin of *musique concrète* that I raise this point, but rather to highlight the hugely differential circulation of El-Dabh within discourse relative to Schaeffer. Statements relating to El-Dabh consider him as "lucky", and "despite himself", "improbably yet inevitably landing at the *Columbia-Princeton Electronic Music Centre*" (Aquarius Records 2000). In distinction to this, Schaeffer is treated as a serious innovator of a new creative form and hence is claimed to provide the origin for all the electroacoustic music which has subsequently appeared. Beyond some pretty clear racist overtones, we also need to consider the forms of specification brought into play through the circulation of Schaeffer's ideas: namely an institutionally-based techno-scientific research paradigm regarding sound. El-Dabh, on the other

hand, can be seen to embody the first key characteristic of this minor, as proposed by Deleuze and Guattari, namely a **detritorialisation of practice**⁴⁸.

We must also note that such practices, techniques and procedures were closely associated with the studio founded by Schaeffer. The *Studio d'Essai*, later renamed *Club d'Essai*, which evolved into the *Groupe Recherche Musicale* (GRM) played a key role in the development of electroacoustic music, and many later composers worked under the aegis of this institution (Francoise Bayle and Bernard Parmegiani for example). To fully unpack these issues, it would, at a future time, be constructive to analyse the relation between GRM and wider state and civil organisations. To study, for example, the historical agendas of the GRM, those of the RTF Corporation (*Radiodiffusion-Télévision Françaises*) which originally hosted the *Studio d'Essai*, and the broader cultural-scientific policy of the French state in the period following WWII. We would not ask why Schaeffer's ideas should have been supported but rather trace the means by which such a practice gained and sustained its dominant position⁴⁹.

At the most recent end of the temporal scale is found a grouping of young artists working with sound, but whose background is in computer programming. *Toplap* (2000 UK), the *IXI* group (2002 Iceland/UK), the multimedia duo of *delire+pix* (2003) and *EMMAX* (2003 Canada), are also notable for the fact that they are all collective endeavours. Such contemporary practice, which is likely to become more customary, reconfigures sound art and emphasises that the form is in a state of change. Collaborative works within the context of digital/algorithmic practice also indicate the relative obsolescence of debates connecting such contemporary sound art to either traditional fine arts or art music. This **collective assemblage of enunciation** is a second key characteristic of the minor (Deleuze and Guattari 1986:17).

Practice occurring after 2000, and outside the traditional centres of sound art (Europe, North America, Japan and Australasia) is also presented in the minor. I am unconvinced that the small grouping from China (Chin Sung Li (b.1984 Hong Kong), *Aitar* (a laptop duo formed in 2000 (Maximin 2004)) and

⁴⁸ In the sense of his initial geographic distance from the metropolitan centres of experimental sound practice, and crucially his cultural identity. We also see how his later entrance into the territory of the major (the *Columbia-Princeton Electronic Music Centre*) represents one of the two trajectories associated with the deterritorialisation of art/music practice as manifest by sound art. i.e. "the artificial enrichment of the major".

⁴⁹ We may also wish to consider the GRM in relation to a number of comparable, but distinct, entities established at this time (i.e. *Studio für Elektronische Musik*, Cologne, Germany (1951), *Columbia-Princeton Electronic Music Centre*, New York, USA (1951), *Studio di Fonologia de la Radio Audizioni Italiane*, Milan, Italy (1953), *Philips Research Laboratories*, Eindhoven, Netherlands (1956), *Studio Eksperymentalne*, Warsaw, Poland (1957) and *Apelac*, Brussels, Belgium, (1957-58).

FM3 (formed in 2001 and best known for their *Buddha Machine* sound object (2006)) is the full extent of contemporary auditory practice in this hugely important country. I would suggest that it is likely that there is, or will soon be, a sizable body of sound art created in this context⁵⁰.

There are also artist-functions found in Scandinavia (Finland⁵¹, Norway⁵², Sweden⁵³) the small number presented in the minor node of *Immersion*, should I think, as with the Chinese example, be taken to indicate the existence of more activity requiring greater attention, not least of which being the fertile area of Swedish text-sound composition. Discussions of the specific national contexts can be found ((Andersen 2005) and (Hammer 2006))and it would be productive to make a comparative study of the distinctions made between sound art (the Anglo-American), *klangkunst* (Germanic), *lydkunst* (Norwegian) and *ljudkonst* (Swedish), as well as a mapping of contemporary Scandinavian practice as informed by installation, sculptural and digital paradigms. The fact that the *ImMApp* research has been conducted in English has clearly inhibited the possibilities for such comparative efforts.



Immersion: Geography: England

It is also clear that the practices of many UK-based artists are failing to reach the centres of discursive formation, if these are understood to be in any way connected to the production and distribution of canonical texts. Joe Banks, Vicki Bennet (a.k.a. *People Like Us*), Peter Cusack, Simon Elvins, Jem Finer, Jonty Harrison, Zoe Irvine, Hayley Newman, Katherine Norman, *Project Dark* and Nadine Robinson each have particular practices that have much to contribute to discourse. It also appears that major discourse is failing to reach such minor practitioners, as Kersten Glandien wrote in 2001,



Immersion: Artist Functions: Katherine Norman

“All these people are to a great extent outsiders in their own fields and also know very little of and about each other - unconnected and often unappreciated. Recognising these outsider works under a sound art perspective, and looking at what they have in common despite their different starting points, requires a

⁵⁰ This suggestion is supported by, for example, the 2003 CD *China The Sonic Avant Garde* (post-concrete 2003). Compiled and edited by Dajuin Yao, Chinese sound artist and radio host. The release was ‘highly recommended’ by Peter Cusack’s *Vermillion Sounds* radio show.

⁵¹ Simo Alitalo (b. 1954).

⁵² Bjørn Askefoss (b.1956), Maia Urstad (b.1960) and Maja Ratke (b.1972).

⁵³ Hanna Hartman (b.196?) and Jesper Norda (b.1972).

different approach, and this in turn demands a discourse... In Britain this discourse does not exist and this severely effects the art itself" (Glandien 2001:1).

While the rupture between practice and discourse is identified by Glandien, we must note that this observation was made almost a decade ago, and since that time the situation has changed somewhat. Further, we must also consider that although there may be little evidence of formalised exchanges between artist-functions and agents of discursive formation (critics, theorists, curators) in the UK, we must acknowledge the informal exchanges occurring at the local level between specific interest groups⁵⁴. We must also take into account firstly the expansion of media art/sound art events, both inside the traditional geographic core of activity, and, more recently, outside these relatively narrow confines, and secondly the role of the electronic networks in the post-millennial global context, all contributing to the increased propagation of sound-based art.

Glandien emphasises the affirming aspects of discourse, that:

"A discourse provides a connection between people working in the same field. It gives an audience the possibility to access a work. It develops tools to talk about both the work - and what is so vital in this field - about its cultural context. A discourse provides historical references and finally, allows awareness and interest to grow and audiences to develop" (Glandien 2001).

Continuing in this geographical vein, perhaps we would be unsurprised to find that significant European⁵⁵ and Australasian⁵⁶ artist-functions receive no acknowledgment from those approaching sound art from a North American perspective (Lander, Kahn, LaBelle, Licht). What is perhaps more interesting are those North American artists who are also sidelined by the type of discourse sustained by these authors.

The first interesting aspect of this is related to time, with a group of young artist-functions being unacknowledged. So we see that Jonah Brucker-Cohen's (b.1976) explorations of network interactions; Joe

⁵⁴ Loci of such informal discourse within England would include the *London Musicians' Collective*, the *Woman's Audio Archive*, London (c.1985), William Furlong's *Audio Arts* publication, *The Wire*, *ReR Quarterly*, the record labels *Obscure* (owned by Brian Eno and releasing works by David Toop, Max Eastley, John Cage and others), and *Touch*, as well as between audience members present at various art exhibitions, live performances, concerts and media events.

⁵⁵ Notably Austrians, Karlheinz Essl (b.1960) and Mathias Gmachl (b.1976), Germans Iris Garrelfs (b.1969), Tilman Kuntzel (b.1959), Norbert Walter Peters (b.1953), and Swiss artists Walter Fähndrich (b.1944), Florian Dombois (b.1966) and Pe Lang and Zimoun (formed 2004)

⁵⁶ Joan Grounds (b.1939) and Sherre de Lys, Bruce Mowson (b.1975), and James Hullick (b.1976) from Australia, and Philip Dadson (b.1952) from New Zealand.

Colley's (b.1976) performances/ installations ("regarded as one of the U.S.'s finest sound artists" (uncredited 2006)), the often confrontational strategies of the activist group *Ultra-Red* (formed 1994) and the phonographic work of Patrick McGinley (b.1976) and Abinadi Meza (b.1976) are all marginalised by major discourse. Each of these artist-functions made statements prior to the publication of *Background Noise*, and most were active before the appearance of *Noise, Water, Meat*, yet it appears that their practice was considered irrelevant by those authors, if indeed, such statements were considered at all. A selection of McGinley's phonographic work is presented in:



Immersion: Artist Functions: Patrick McGinley

Secondly, we see also that certain specific practices and techniques are poorly dealt with by major discourse. We see that artist-functions active in phonography and field recording are disproportionately represented in the grouping of 'minor American' sound artists (Dallas Simpson, John Hudak and Steve Barsotti as well as McGinley and Meza mentioned previously), as are those involved in circuit bending (David Lee Myers, Qubais Reed Ghazala).

One artist-function who surprisingly is found within this minor grouping is Miller Puckette, whose influence upon contemporary sound art must be acknowledged as huge. Puckette's importance derives from his central role in the development of *Max/MSP* and *PureData*. These software programs are pervasive in contemporary sound art, he is significant not only conceptually, thematically and paradigmatically (much extending the possibilities of multimedia) but also pragmatically on the levels of practice, technique and materiality. The number of artist-functions using the software are countless⁵⁷ and given Puckette's positioning regarding some key institutions (as a member of MIT's *MediaLab* until 1987, a researcher at *IRCAM* 1989-1994), and his clear awareness and acknowledgment of the tradition extended by his work (naming *Max/MSP* after fellow innovator Max Mathews who also held a post at *IRCAM*), it is curious that Puckette's ideas should be absent from major discourse.

Immersion also shows that such discourse also excludes what might be described as practices of the other. This is clearly a problematic area, and I hesitate to use such terminology, yet the existence of a group

⁵⁷ Including Christof Migone, Toplap, Thor Magnusson, Brandon Labelle, Gordon Monahan, Steve Heimbecker, Kim Cascone, Andrea Polli, Pauline Oliveros, Karlheinz Essl, Bjørn Askefoss, Miki Yui, and many others.

of challenging artists within this category of the minor, whose practice is distinct from the normative positions taken by the majority of the 'major' artists, is clear and vital to articulate.

One clear cluster is around sexuality, and of those American sound artists who explicitly make their sexuality part of their creative practice, in the sense of some engagement with radical queer politics, all of them fall into the minor. Terre Thaemlitz, Bob Ostertag and *Ultra-Red*, each of whom critically address notions of sexuality in their work, are absent from major discourse. This absence is curious, and it is hard to imagine a contemporary treatment of any another art-form where such a silence would be found.

Equally apparent are those artists with an Afro-American heritage. Pamela Z., Keith Townsend Obadike, Beth Coleman, and Camille Norment, each of whom enjoy international profiles and have a significant body of quality work behind them, are also unacknowledged in major discourse. If we consider black sound artists from an international perspective, with only one exception (Paul D. Miller a.k.a *D.J. Spooky*) all black sound artists are found within the realm of the minor. For none of these artists' statements to have been treated seriously in major discourse points towards some dubious tendencies and prejudices both on individual and institutional levels.



Immersion: Nodes: Race

This uncomfortable grouping of diverse artists provides us with the third and final characteristic of the minor: **the connection of the individual to a political immediacy** (Deleuze and Guattari 1986:16). Within the privileged environments of the major, space is mere background (*Background Noise?*). In the context of the minor however, "the cramped space forces each individual to connect to the political" (ibid). That some of the key social issues of our contemporary era (HIV, racial relations, gender politics, cross-cultural exchange) are denied circulation by major discourse, which instead settles on an unchallenging territorialisation of dominant affordances, should surprise no-one. That such discourse then provides a certain basis for the appearance or otherwise of future statements, points less towards a depreciation of critical practice, but more towards the increasing isolation and irrelevance of the intellectual in contemporary society.

The content of *Sound by Artists, Noise, Water, Meat, and Background Noise*, the intentions of the publishers and author, and even the *raison d'être* of such publications seem questionable when confronted by the richness and range of contemporary sound practices produced by artist-functions occupying a position of otherness, either in terms of their sexuality or race. This point is further emphasised by considering the minor node as a whole and the significant presence of female artist-functions within it.



Immersion: Nodes: Female

While practice is dominated by men, the activity of women is not only apparent, but is also influential and much better supported than the work of black or queer artists. Pauline Oliveros, Meredith Monk, Maryanne Amacher, Hildegard Westerkamp, Laurie Anderson, Christina Kubisch and Janet Cardiff are all well-known and the importance of their work is well established. However, I wish to avoid making any assumptions about the experiences of women working within sound art and would emphasise the need for a closer study of historical and contemporary practice from a clearly gendered position. That such a work does not exist at the current time, is perhaps unsurprising given the current state of a critical language of sound art as I have shown regarding the clear limitations of the positions occupied by Lander, Kahn, LaBelle the *Australian Sound Design Project* and *soundtoys.net*.

6.4. Chapter 6: Conclusions

“...as an artist, the question is: how do you articulate an omnipresent space, or how do you articulate a construction such as that? ... So the idea of it is really to cut it up into sections, which is no different than the first perspective devices...” (Heimbecker 2005)

To summarise the major findings:

- It is indeed possible to transform a MySQL database of sound art into an IDE format.
- An immersive environment provides a suitable space for reflection upon major treatments of sound art and succeeds in unframing habitual conceptions of the field.
- The discursive fields of Kahn and LaBelle are severely limited. Both these authors fail to engage with the majority of statements available in the historic archive of sound art.

- Clear ruptures between the major canon and the actualities of practice have been uncovered. Such faultlines occur along lines of race, gender, age, specific practices and language/culture divides.

The deconstruction of sound art into interconnected elements presented in an IDE is presented in this research as problematic, worthy of investigation and potentially enhancing to traditional forms of discourse analysis. Unlike the written texts of Lander, Kahn and LaBelle which construct narratives of practice; my methodology has been focused at the micro-scale, where the nature of the relational technology results in a granulation of practice and discourse. Sound art has been treated through natural language, but the conclusions of the work are enhanced through algorithm. Coherence is neither ensured through a top-down application of theory to practice, nor as a bottom-up application of practice to theory, but as what we might call a 'detonation' of practice where the disassembled grains can be reassembled in synthetic space through the application of semantically structuring algorithms (Figure 6.4.).

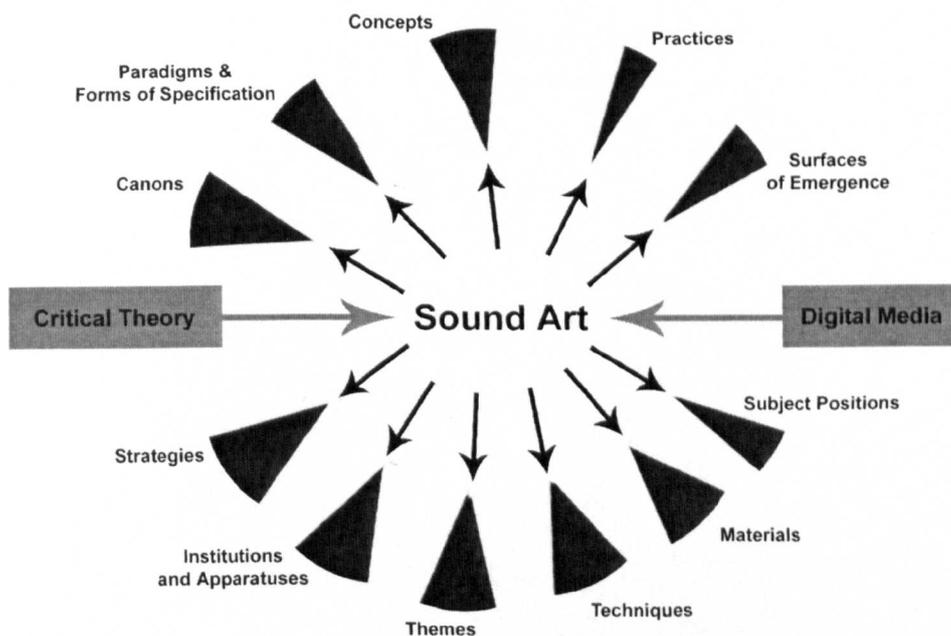


Figure 6.4. Scope of the Project (Conclusions)

Immersion cuts up the unities of artist-function and statement and constructs an alternative reading where these elements are deconstructed into constitutive attributes. This reductive approach treats the contents of traditional discourse (artist-functions, statements (artworks) and institutions) as divisible into a schema derived from the conventions of database design. The presentation of this reconfigurable source

material, while missing some of the critical analysis provided by the strategies of Lander, Kahn and Labelle, complements such methods through a coherent mapping of data in the abstracted coordinates of 3D digital space, and the (re)-presentation of these elements in an IDE.

Beyond this innovative presentation, the most significant aspect of the *ImMApp* is its problematisation of existing major discourse. The rather uncomfortable territory touched upon by the minor identifies some unpalatable qualities of the major. My aim in highlighting the minor has not been to contribute further to the ghettoisation of artist-functions excluded by the major, but to suggest that a more general discourse of sound art can be much enriched through the serious and critical appraisal of such 'minor' statements.

Chapter 7. Limitations, Conclusions & Future Work

article on sound art

Sun Sep 21, 2008 3:04 pm (PDT)

Posted by: "Bill Thompson" billthompson@billthompson.org [prof lofi](#)

Hi all,

Was doing a little research about radio art and came across an article that involved sound art and radio art and thought I'd share it:

http://www.tate.org.uk/intermediaart/radio_art_text.shtm

Anyone else find any good online articles about sound art lately?

Bill

<http://billthompson.org/>

<http://groups.yahoo.com/group/soundasart/>

Experimental Music Radio at: <http://thefogonshnuufm.blogspot.com/>

The link in this posting from academic and sound artist Thompson (Thompson 2008) to the *soundasart* yahoo list (Thompson 2005) leads to an online article hosted by the Tate Gallery. The area of activity under which the article falls, from the Tate's perspective, is defined as *Intermedia Art: New Media, Sound and Performance*.

Thompson makes another post later that day providing a link to a BBC News⁵⁸, containing a video clip, and a short piece of text informing us that:

A section of road in California has had grooves cut into it so car tyres play the William Tell overture, otherwise know as the theme from The Lone Ranger.

But the noise has been irritating residents in the town of Lancaster so much that it is now going to be resurfaced.

The quarter-mile stretch of road was part of a car advertising campaign.

The sound is made by specially cut grooves in the asphalt that emit different sounds as the tires pass over them, similar to a stylus on a record player gliding across a vinyl LP.

SEE ALSO

* The musical toilet from Japan (01.11)

* Punk-loving dancing robots (01.44)

(uncredited 2008)

The extracts above provide some sense of the contemporary context of sound art. The existence of the electronic networks, and the growing maturation and diversification of sound art is facilitating creative

⁵⁸ <http://news.bbc.co.uk/1/hi/world/americas/7628668.stm>. Accessed 22nd September 2008.

exchanges between geographically dispersed artist-functions, institutions and other relevant entities. The *Immersion* immersive environment is historically and culturally determined by such a context and its articulation of sound art as an IDE surrounds immersants with the phenomenological actualities of the re-presented sound art statements.

The samples of the *ImMApp* presented in this document and the accompanying DVD are only a tiny proportion of the whole dataset, and what does not translate well is the sense of movement, simultaneity, contradiction and discontinuity experienced when directly exploring the environment. It is this relation between the phenomenological experience of auditory artefacts, their spatial distribution in synthetic space, the supporting contextual material and the overall post-convergent methodology that continues to intrigue me.

The work has involved a number of divergent concerns, and there are several aspects one needs to grasp in order to evaluate the contribution made by the project. Early in Chapter 1 the project aims were presented and my claims for originality stated. Let us remind ourselves of these, the *ImMApp* project was to involve:

- A novel re-formulation of historical and contemporary sound art through the development of a **critical ontological schema** derived from Michel Foucault's *Archaeology of Knowledge* (Foucault 1972). (Discussed in Chapter 2, the end of Chapter 3 (p47) and more fully in Chapter 6 (p93).
- An unprecedented **mapping** of previously dispersed sound art practices through the development of a digital archive (Discussed in Chapters 5 and 6).
- The creation of a computer environment allowing the exploration and creative interaction with the archived material. This is the practice-based element of the thesis and is made up of two iterative parts:

ImMApp: Surface (a web browser-based database application).

ImMApp: Immersion (an immersive digital environment).

To reflect upon these issues, I will turn this final discussion towards these two main areas of practice.

7.1. *Surface*: The Database

The *ImMApp* database is, to my knowledge, the most extensive digital archive of sound art in existence. In presenting the work at conferences, symposiums and workshops, its potential for enhancing discourse has been positively recognised by practitioners, academics, and non-specialists alike. While material representing the practices of over 250 artists has been gathered, this is only a tiny sample of what sound art has, and does, involve. Conclusions should only be made upon the basis of representative sampling, and it is my belief that the majority of sound art statements still reside in obscure corners of gallery and museum archives, artists' personal libraries and the crepuscular margins of the internet.

There are, however, some conclusions that can be convincingly conveyed. While there is, for example, a primary discursive axis between metropolitan Europe, coastal North America and Japan, there have been important statements produced outside the art metropolis for many years, notably Australia, New Zealand, and Scandinavia. There is a disconcerting silence from Africa, South-East Asia, India, the Arab world, China, Meso and Latin America. Whether due to an absence of production, or to a lack of accessible documentation, this remains at this time, unknown. I would suggest however, the likelihood in the near-future, of innovative auditory practice occurring in such contexts, if in fact this is not already the case⁵⁹.

Despite these apparent silences, one strength of *Surface* is its attempt towards inclusivity, not only in terms of the included artist-functions and statements, or the inclusion of supporting audio-visual material (over 900 audio examples, nearly 2000 images and around 150 video files), but in the attention given to the three main foci of the Foucauldian-derived methodology, namely, artist-functions, statements and institutions. *Surface*, unlike the *Australian Sound Design Project*, or *soundtoys.net*, is not a promotional tool, nor is it tied to nationalistic or exclusively digital paradigms. It has, as far as possible, attempted to document representative practice from a broad range of historical, geographical and paradigmatic domains.

⁵⁹ Such suggestions are supported by the recent compiling of experimental music practitioners and sound artists in Africa and Asia in (Kirdec 2009) and the previously mentioned documentation of the blossoming Chinese avant-garde.

The database does raise some questions however. As the initial focus was upon **artist-functions** and their **statements**, the role of **institutional** agents has by necessity occupied a tertiary position. The analysis provided by *Surface* in its current state would be well-served by an expanded survey of practice involving a much closer mapping of statements, and a simultaneous extension of the definition of **statement** as used in *Surface*, to include, for example, instructions to installation staff, exhibition invigilators and curators, proposals made to funding bodies, artist statements and exhibition catalogues.

A further difficulty is associated with the **node classes**. The tagging of **artist-functions** with nodes is a clearly reductive approach, and I wholly acknowledge that this search for connectivity can easily eradicate what is unique in each entity. It has been the intention however, to articulate the specificities of practice, and to demonstrate that what constitutes an artist-function is a complex combination of the nodes which have been abstracted into the *ImMApp* ontology: that **artist-functions** are produced by discursive means: circulated, sustained, or excluded by the interplay between the **subjectivities, techniques, materials, practices, concepts, paradigms, surfaces of emergence** and **canons** considered legitimate in discourse.

7.2. Immersion: The IDE

The search for the technical means by which to deliver an IDE based upon a database of sound art was a challenging aspect of the project. A number of alternative technologies were explored, and rejected, before the decision was made to commit to X3D. This has proved to be a satisfactory solution, yet some limitations need to be mentioned.

The first important limitation is in the process by which X3D is generated via XSLT from the MySQL database. This currently depends upon a semi-manual process using *Netbeans*. A more satisfactory solution is achievable with a combination of *Apache Ant* (Davidson 2000) and the *Saxon B* XSLT processor distributed by Michael Kay (Kay 2007). This solution would entirely automate the process, and while this is possible using the current framework, its implementation is outside the scope of the current work.

Audio was always an important part of *Immersion*, and the intention from the outset was to create a multichannel sound installation. This requirement was important in deciding upon X3D as a suitable

technology. However, sound spatialisation in X3D is elementary, and it is to me vital to link the practices of real-time 3D environments, such as X3D, with the more developed explorations of sound-in-space as suggested by, for example (Bregman 1994), (Smalley 2006) and (Blesser 2007).

With regards to *BS-Contact* (Version 7.107), the X3D browser used to deliver *Immersion*, there are limitations due to the browser's dependence upon Microsoft's *DirectSound3D* component of the DirectX library and WDM audio drivers:

1. The number of audio channels is limited to 7.1 surround sound.
2. *BS-Contact* can only support the spatialisation of mono files, with stereo sources failing to be adequately presented in the virtual space. However, this can be considered an advantage in documenting multichannel soundworks. So, for example, an acousmatic work in 8 channels could be successfully presented, by the work being associated with 8 mono audio files suitably positioned in virtual space. We might also consider how a spatial sound installation may be usefully documented by multiple microphones, allowing *Immersion* to articulate a work's particular exploration of spatial relations, something impossible in stereo playback systems.

7.3. Future Work

The *ImMApp* can be further developed in several interconnected areas: **Information, Interaction and Collaboration**:

7.3.1. Information

- The ontological schema was populated by a manual process of tagging and is fully implemented only at the level of **artist-functions**. In order to articulate a more sophisticated Foucauldian position it would be valuable to fully extend this to **statements** and **institutions**. This would require some form of automation and would therefore involve a phase of more complex MySQL and PHP programming. This would greatly enhance the application as an algorithmically-enabled research tool.
- A closer analysis of **institutions**, their connection to specific **nodes** and particular **artist-functions**, and the changes to these over time would also be a constructive area for future research.

- Statements are currently treated as static objects – this is not necessarily the case, with works often reappearing in a number of different events. This investigation of the movement and reappearance of artworks would be of interest as would be a tracing of the movements of **artist-functions** over time.
- Another potential focus would be the **collection of archive material exterior to sound art**. The incorporation of supporting material (for example, public domain films, commercials, public access footage) would convey something of the material historical contexts surrounding sound art at various epistemic instants, and would explore the notion of causality which, as we have seen, is one of the weaker aspects of Foucauldian archaeological method.
- There is also scope for the continued gathering of documentation of sound art statements. By involving artist-functions and institutions, not only would a shared archive of statements be created and sustained, but also the identity of the *ImMApp* would evolve into something more social, following the trends set by Web 2.0 discourse (see below).

7.3.2. Interaction

- The current means of interacting with *Immersion* is via a typical game pad. This is adequate, but should the IDE be made publicly available, it would be appropriate to develop a **more involving means of interaction**. *BS-Contact* supports such input device extensibility and through hardware/software customisations more novel solutions may be explored.
- Such exploratory interfaces may also be linked to **more complex interactions with the virtual space**. We could imagine for example audio and video processing capabilities, as well as more creative mixing, morphing, and file selection possibilities, and in such a way *Immersion* would become more of a creative environment. Such creative and unpredictable interaction, while possibly natively supported by *BS-Contact*'s extended node set (with the function-based extensions developed by Liu and Sourin being of particular interest (Liu 2006), (Sourin 2006), (Liu 2006)), is likely to require collaboration with colleagues familiar with such skill sets as *C++*, *Java*, *vvvv*, *PureData* or *Supercollider*.

- One area related to this is the poor support of audio in X3D, with the audio spatialisation being of the most primitive kind. By creating a distributed network of computers, visual rendering and audio processing tasks can be handled by different machines. In this way, audio spatialisation, and **more sophisticated DSP** could be handled by a dedicated machine running *PureData* for example.

7.3.3. Collaboration

The area with, to my mind, the greatest scope for continued work with the *ImMApp* framework is that of collaboration and multi-user environments.

A reoccurring question about the *ImMApp* has been the criteria for inclusion within the dataset. That such inclusion has been the result of my own subjective choices is not without its value or interest, but the *ImMApp*'s format lends itself well to a collective project, one exploring distributed cognition.

- One possible version of this would be to expand *Surface* into a **Web 2.0-modelled collaborative community** organised as a multi-lingual online resource of sound art. A moderated website would readdress the biases evident in the application as it exists now. Further to this, a download could be available allowing remote users to explore the fully immersive version of the database. Hence, multi-site, multi-participant network collaboration would become possible. The scope of this for an enhanced global conception of sound art is an interesting proposition.
- The second possibility is that of developing a **multi-user immersive environment**. This may take the form of a networked project, whereby a number of immersants explore an audio-visual improvisation space. Should such an environment be combined with synchronous activity in the real-world (dancers, robots, pyrotechnics, lighting, additional projections), the creative possibilities would be near inexhaustible.
- Finally, and closely connected to my own interests as an artist, is this **true potential of X3D as a creative tool** ((Behr 2004), (Polys 2004)). The possibilities suggested by the technology are limitless, and X3D has been explored in such diverse areas as cultural heritage ((Smith 2005), (Eliens 2007), (Cabral 2007)), software design ((Anslow, Noble et al. 2007a), (Anslow 2007b)), military simulation ((Neushul 2003), (Mnif 2003)), science ((du Boulay), (Willis), (Gervasi 2006)),

education ((Chittaro 2003), (Sommaruga 2007)), databases ((Brutzman 2001),(Mazzoleni)), multi-user applications ((Fabre 2003), (Dachselt 2006), (Weber 2007), (Chen 2005)), and geography ((Coelho), (Ieronutti 2004), (Jianghui Ying; Gracanin 2004), (Bilasco 2007), (Brutzman 2007)). Future development of the *ImMApp* may be in any number of potential directions, yet in the absence of any external influence, my own activity will be artistic in nature, and a continued investigation of virtual reality as a creative medium in its own right, the scope of which I am only beginning to grasp.

7.4. Closing Remarks

“More often than not, art smoothly participates in the dominant metaphysics and ideology of the culture in which it appears.” (Svanaes 2000:15)

Beginning with a review of print-based discourse, and a comparison of this with some key digital resources, the *ImMApp* deconstructs these into a relational database, before making a final representation of this information in real-time 3D. I view the project as a whole as a **conceptual synthesizer** – a means of parsing information between modular conceptual domains (i.e. post-structural theory, sound art, MySQL, X3D). ‘Signal flow’ is modulated in each module, shaped and sculpted in a practice-based research process. While I have always wanted the application to function, I have considered different possibilities of what this might mean. The main difficulties were not primarily within the modules themselves but rather the means of parsing the signal between them. The *ImMApp* is neither quantitative nor qualitative, but rather an artistic practice-based enquiry. I feel fortunate to have had the opportunity to explore such a domain and this work is simply an attempt to articulate the practices of sound artists using appropriate tools available to the digitised researcher working in the contemporary era.

That my current understanding of sensory immersion is structured by the creation of a synthetic environment is problematic, but usefully so. That an experiential basis for knowledge should be proposed coupled with a technologised and abstracted virtual space is perhaps emblematic of contemporary issues of subjectivities, the production and reproduction of such entities, and broader social, economic and political themes within modern Western discourse. The irony of proposing “immersive spherical thinking as

stimulated by the immersive spherical perspective” (Nechvatal 1999) within this wholly digital environment is not lost on me.

Much contemporary sound art is produced by artists with little or no formal musical training, and music, or musicality is of reduced importance. The works of such artists as Dan Senn, Steve Roden, Barry Truax and Janet Cardiff relate to immersed listening practices that are intrinsic elements of *Immersion*. These sensory resonances knit tightly with the design and development of a technical solution to a conceptual problematic as drawn out by the *ImMApp* methodology.

We must not overstate the auditory however. Many of the works produced by contemporary sound artists relate as much to theatre, film, dance, video, ecology and net art as to purely acoustic concerns. Such cross-disciplinary fluidity is evident in such contemporary pieces as Janet Cardiff and Georges Bures Miller’s recent works. *The Killing Machine* installation is a five-minute choreography of sound, light, and robotics, with the auditory elements occurring within a much richer conceptual and perceptual field (Cardiff 2008). It is perhaps due to this interest in the liminal, the intermedial and the uncategorisable that so many ‘sound artists’ reject the term and remain exterior to such totalising terminology.

We need to acknowledge the changing meaning, usage and experience of sound art as modulated by specific historical and geographical contingencies, and to recognise the impact that the mutations of discourse itself has upon our understanding and experience of the art-form. That is to recognise the dynamic, fluid and differentiated nature of practice, the relation to practice maintained by discourse, and the process by which formations in discourse can in turn constitute the object (practice). I have not sought a final definition of sound art; rather, my aim has been to explore the interplay between the divergent rules which allow a set of practices, theories and statements to occur at a particular time. The level of detail provided by the *ImMApp*, and the primary nature of the information allows an understanding of the auditory arts to develop based in the specifics of practice of individual artists. Through this, and the diversity it represents, we may avoid the dubious territorialisations of heterogeneity as typified by Kahn.

The *ImMApp* is then a practice-based project and one that attempts an articulation of sound art through the use of contemporary technologies. Such mappings are usually found within arts and humanities discourse; while I am aware of such discourse, the *ImMApp* is essentially interdisciplinary, and alongside

the exploration of sound art, is a detailed and in-depth investigation of an area concretely within the domain of computer science.

The particular strength of the project comes about through this ongoing shift in perspective between critical theory, art history, computing and the goals of a practice-based creative project. The digital methodology opens an alternative interpretation of sound art through the application of algorithms. Moving along the opposite vector, the critical theory associated with the study of an art history provides a critical framework with which to problematise the creation of a sophisticated immersive digital application.

Finally, the *ImMApp* involves sustained and focused interactions with digital audio-visual artefacts, facilitated by an abstract, dematerial and virtual environment. The choices made in designing such an environment, and later in exploring such a space: a virtual journey aimed at articulating one or more aspects of sound art, are of a very different order to those made by an author writing for print media. While I cannot speculate upon the final experience of this, I remain convinced that this presentation of sound art opens a valuable space for a reinvigorated debate on sound art and the potentials of digital immersion.

“The technique of art is to make our understanding of both perception and history at first unfamiliar, particularly when attempting to increase our perception of, and neurological feeling for, data-space and its vast powers to handle complex and abstract information.” (Svanaes 2000:46)

Appendix 1. Extract of Email Interview with Hildegard Westerkamp

TAYLOR: *Can you tell me something about the context of sound art in Canada at the time of the book's publication (Sound by Artists: Lander 1990)?*

WESTERKAMP: From my perspective of someone who was mostly focusing on soundscape and acoustic ecology at that time, as well as radio broadcasting, I became aware of sound art mostly through broadcasting. We were working with people on *Vancouver Co-operative Radio*, who like me, were interested in broadcast experiments, i.e. considering radio as an artistic medium, which was a rather new concept over here then. So in a way those were the beginnings of what is often called radio art. I was usually more interested in the environmental issues of the soundscape and that was when my program *Soundwalking* was born. But I was also involved in the beginnings of radio art programs at the station. In fact, in the 80's, the Canada Council had established a section for funding audio art and *Co-op Radio* benefited a lot from that. The result was regular broadcasting of quite a range of sound and noise art.

TAYLOR: *How were you approached for your contribution?*

WESTERKAMP: I don't remember the details. But there was a bit of a network in Canada of people who worked with sound, including the *Canadian Electroacoustic Community (CEC)*(Ogborn 1987), which was formed in the early 80's. I think Dan Lander was part of the CEC and we met either at various CEC conferences and/or alternative radio conferences and gatherings. At that time there were many discussions and debates about the role of radio, about environmental sounds, soundscape, sound art, electronic/computer music. All of these were somehow connected and in many cases, the people involved in alternative radio and sound art or electroacoustic composition were the same. More and more university stations kept springing up all over the country who broadcast pieces of experimental sound/radio art, soundscape work, electroacoustic composition, as well as the debates around all of that.

TAYLOR: *How joined up was your view of sound art previous to the book's publication and how aware were you of other Canadian sound artists?*

WESTERKAMP: Some of this I already answered in the previous question. But I should stress perhaps that the late seventies and eighties were extremely interesting times in Canada, as there was enough money to fund for example regular CEC meetings. This is significant in a country as large as Canada, as it allowed

us to meet each other and get to know each other in a series of regular conferences/ festivals. It meant that we were connecting strongly and with knowledge of each others' work and interests. The same applied to alternative radio. The funding was very much in the spirit of supporting Canadian (multi)culture and deepening a sense of what Canadian culture might be. Remember we are a young country and neighbours of the US. So this was significant on all sorts of levels, Canadian identity, distinguishing our culture from US mass media culture, finding our own cultural 'language' and some pride in it as well.

The book is a sign of available funding at that time that allowed the editors to bring some of the existing ideas and sound art productions together and create some general awareness of what was happening at the time nationally and internationally. I am speaking a lot of funding here because I see an incredible difference between then and now. At both times we have a generation that is creative, adventurous. But for today's generation there simply is not as much money around to support its creative activities and ideas. In the seventies and eighties we had the good luck of much financial support for all sorts of outlandish projects as well as for getting a sense of a community working together.

I was aware of or had met most of the contributors to this book as well as the one following in 1994 (Augaitis 1994), both the Canadians as well as the international artists.

TAYLOR: *Were you presenting your work as 'sound art' at that time, or was it something else?*

WESTERKAMP: I was frequently participating in the context of sound art, such as in Banff or *Co-Op Radio* (Bull 1993), as well as in the electroacoustic community. But my work was always focused soundscape work and as that seemed to bridge the various scenes. I never felt myself to be a central part in any of them, but somehow was included in it anyways. The word soundscape composition did not yet exist at that time on a wide scale and I was not really interested in any definition anyways. I was interested however, in encouraging deeper listening to the environment, (thus the program *Soundwalking*) and I was dreaded by some in the electroacoustic scene for always questioning and fighting against the high sound levels in concerts.

Appendix 2. Extract of Email Interview with Steve Heimbecker

HEIMBECKER: “To comment specifically about *Sound by Artists*, and the context in which it arrived. I was in Calgary at the time, and living and working in an artistic vacuum filled with avant-garde painting, video and performance artists, and punk rock. As odd as it may seem I was never told or taught about audio or sound art until 1987, and even then it was very vague. Even though I had been making audio art for some years already, it was not a very well understood or popular artistic exploration in Calgary in the late 80's and early 90's. I learned most of my chops between kinetic sculpture and punk rock. So, *Sound by Artists* was the first time in my career that I felt like some validity had been given to the art form, and I could point to it and say “See, I'm not crazy.”

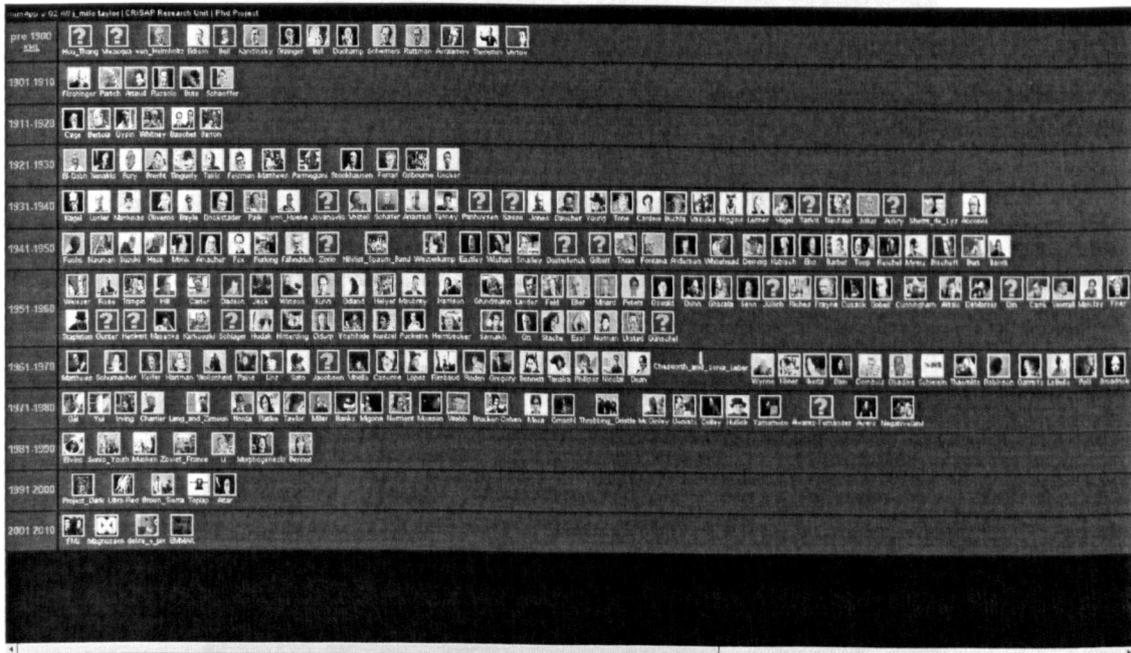
For me however, I still see a huge division between sound art produced by people with a musical history, and sound art produced by people with a visual fine art history, and it's virtually impossible to tell each of these groups that there is a difference. The musical history people seem to think it's very simple to add visual and spatial elements to sound and therefore typically do it badly. The fine art history people tend to think sound is very simple and tend to do it very badly. Of course there are a lot in the middle that can do both well, primarily because these artists are good artists, but even here I think the histories of the two cause divisions...

I also believe there is a division between audio art and sound art that no one wants to address. Sound art has become that catch all phrase, but I still prefer the term audio artist for myself...

I know now that everything I am doing in my life and my art will be done because I have decided to do it. I need to be self-sufficient as much as possible. I have never really been popular - especially among the art and music elite. I don't know if it's my personality or not, or that my work is somehow too challenging/ against the grain/or made obtuse by combining too many creative strategies...”



Appendix 3: Figure 3. January 2009: *Surface* Homepage showing artist-functions ordered by year of birth, a selection of nodes (left) and alphabetic ordering of artist-functions (right)



Appendix 3: Figure 4. January 2009: *Surface*. Artist-functions ordered as a time-line by year of birth.

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Luigi Russolo

Date: 1906
Country: Italy
Bibliography
URL: XML

[Edit Artist Details](#)

9 nodes

Music
Rumor
Public_Space
Fascism
Background_Noise_(LaBelle-2006)
Sound_by_Artists_(Lander-1990)
Noise_Water_Meat_(Kahn-2001)
Rezonanzen_(Schulz-2002)
Sound_Art_(Licht-2007)

It was Russolo's belief that noise was the sound of music for the new century. In his manifesto *Art of Noises* (1913), he wrote, "Ancient life was all silence. In the nineteenth century, with the invention of the machine, Noise was born. Today, Noise triumphs and reigns supreme over the sensibilities of man. (1) He further believed that rhythm and pitch selection had been determined at an early point in man's history and the complex components such as polyphony were man's ways of adding progress to music. It was because music had reached such a great complexity, he concluded that the incorporation of noise as part of the musical language was the next logical step. He further wrote, "we must break out of this narrow circle of pure musical sounds, and conquer the infinite variety of noise sounds... Let us wander through a great modern city with our ears more alert than our eyes, and enjoy distinguishing between the sounds of water, air, or gas in metal pipes, the purring of motors which breathe and pulsate with indigestible animations, the throbbing of valves, the pounding of pistons, the screeching of gears, the clatter of streetcars on their rails, the creaking of ships, the flapping of awnings and flags; We shall enjoy fabricating the mental orchestrations of the banging of store shutters, the slamming of doors, the hustle and bustle of crowds, the din of railroad stations, foundries, spinning mills, printing presses, electric power stations, and underground railways."

4 Selected Works

Worktype	Info	Year
Intonarumori	Noise Instruments	1916 Edit
Gran Concerto Futuristico	Sound Work	1917 Edit
Risveglio di una Città	Audio Work	Futurism and Data Reviewed - LTMC0 2301 1921 Edit
Rumorharmonium	Instrument	Circle and Square, Exhibition, Paris Gallery 1930 Edit

14 Audio

- audio/Russolo-Luigi_01_Oraciatore.wav
- audio/Russolo-Luigi_02_Oraciatore.wav
- audio/Russolo-Luigi_03_Ululatore.wav
- audio/Russolo-Luigi_04_Gorgogliatore.wav
- audio/Russolo-Luigi_05_Ronzatore.wav
- audio/Russolo-Luigi_06_Arco-Enfermonico.wav
- audio/Russolo-Luigi_07_Serenata-1921.wav
- audio/Russolo-Luigi_08_Lavatore-Dro-Op-33.wav
- audio/Russolo-Luigi_09_Macchina-Tipografica.wav
- audio/Russolo-Luigi_10_Canzone-Rumoristi.wav
- audio/Russolo-Luigi_11_Canzone-Rumoristi.wav
- audio/Russolo-Luigi_12_Canzone-Rumoristi.wav
- audio/Russolo-Luigi_13_Canzone-Rumoristi.wav
- audio/Russolo-Luigi_14_Canzone-Rumoristi.wav
- audio/Russolo-Luigi_1521-Risveglio.wav
- audio/Russolo-Luigi_1521-08_Corale.wav
- audio/Russolo-Risveglio_di_una_citta.wav

0 Video

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Appendix 3: Figure 5. January 2009: *Surface*. Luigi Russolo. Associated images (top left), nodes (top right), additional information, selected works, and audio and video files (bottom).

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Edit Artist 343.0000000000086E-005



Nodes

8.000000000008E-006

Music
Noise
Public_Space
Fascism
Background_Noise_(LaBelle-2006) [Edit Artist Nodes](#)
Sound_by_Artists_(Lander-1990)
Noise_Water_Meat_(Kahn-2001)
Rezonanzen_(Schulz-2002)
Sound_Art_(Licht-2007)

Luigi

Small Image

Main Image

URL

AKA

YOB

Country

YOD

Notes

It was Russolo's belief that noise was the sound of music for the new century. In his manifesto *Art of Noises* (1913), he wrote, "Ancient life was all silence. In the nineteenth century, with the invention of the machine, Noise was born. Today, Noise triumphs and reigns supreme over the sensibilities of man. (1) He further believed that rhythm and pitch selection had been determined at an early point in man's history and the complex components such as polyphony were man's ways of adding progress to music. It was because music had reached such a great complexity, he concluded that the incorporation of noise as part of the musical language was the next logical step."

Bibliography

[<< Back](#)

[Delete](#)

[Update Artist Details](#)

Selected Works [Add New Work](#)

1.999999999999999E-005				
Rumorharmonium	Instrument	1930	France	Edit
Risveglio di una Città	Audio Work	1921	Italy	Edit
Gran Concerto Futuristico	Sound Work	1917	Italy	Edit
Intonarumori	Noise Instruments	1916	Italy	Edit

Appendix 3: Figure 6. January 2009: *Surface*. Luigi Russolo. Data entry page.

Appendix 4: *Surface*. Example of PDF output function: Work Node: 'Journey'

ImMApp: Archive of Sound Art : Selected Works relating to : Journey | Phd Project : J Milo Taylor : CRISAP Research Unit : LCC : UAL

	Work Title	Country	Year	Materials	Audio	Image	Video
Meredith Monk	PARIS	USA	1982	Color, Sound, 26 Minutes, 1, 3/4 and 1/2 videotape.			
Francis Bayle	Jetta-reiour	France	1985	-		Yes	
Jonty Harrison	Sorties	Austria	1995	Commission			
Gilles Gobeil	Nuit cendre	Canada	1995	-			
Katherine Norman	Bells and Gargoyles	United Kingdom	1996	Hardware Used: NeXT computer Software Used: Macintosh	Excerpt		
Denis Smalley	Empty Vessels	United Kingdom	1997	-	Excerpt		
Tacita Dean	Mosquito (Magnetic)	United Kingdom	1997	Magnetic track and chinagraph			
Tacita Dean	Trying to Find the Spiral Jetty	United Kingdom	1997	Recordings			
Scanner	Surface Noise	United Kingdom	1999	-		Yes	
Janet Cardiff and George Bures Miller	The Missing Voice (Case Study B)	United Kingdom	1999	-	Excerpt	Yes	
Scanner	On Broad Street	United Kingdom	2000	-			
Joe Colley	knowing when to not know	Greece	2001	-		Yes	
Scanner	Imagined Departures	Sweden	2001	-			
Hildegard Westerkamp	Into the Labyrinth	Canada	2001	-		Yes	
Katherine Norman	You need a cab?	United Kingdom	2001	Hardware Used: PC Software Used: CoolEdit and AudioMulch, plus a bit of cmix	Excerpt		
Ultra-Red	border sounds	Various East European countries	2001	-	Excerpt	Yes	
Chris Watson	A Swallow's Journey	United Kingdom	2002	-			
Chris Watson	Weather Report	United Kingdom	2003	-		Yes	
Scanner	Echo Ricochet	Australia	2003	-		Yes	
Bernhard Gal	soundbagism	USA	2004	Suitcase, black clothes, cd-player, active spe			
Joe Banks	Sense Data and Perception	United Kingdom	2005	-		Yes	
Ros Bandt	Mungo	Australia	2006	Environmentally Sensitive Installation, Outdoor Installation, Temporary Installation and Interactive Installation	Excerpt	Yes	
Richard Charlier	Retrieval paths	Australia	2007	-			
Hildegard Westerkamp	MotherVoiceTalk	Canada	2008	-	Excerpt	Yes	
Trimpin	IF VI WAS IX: Roots and Branches	USA	2008	For two digital soundtracks		Yes	
J_Milo Taylor	Obstruction Placed in the Path of the Artist	Germany	2008	-		Yes	
Barry Truax	Chalice Well	Canada	2009	for eight digital soundtracks	Excerpt	Yes	

Appendix 5: X3D Browsers

There are several X3D browsers available. Here is a summary of the relevant aspects of the most prevalent.

	License	Operating System	Audio	Notes
Flux Player	Open source	Windows		Collada import, Direct X, LoadSensor Node.
Octaga	Commercial	Windows, Linux, Mac	Spatialised Sound	Supports panoramic video projection, rigid body physics particle systems, and game controller interface.
BS-Contact	Commercial	Windows	8 channel	Supports haptic interaction, remote control, CAVE and Powerwall, Physics Simulation, Collada, multi-user, live video, AR.
FreeWRL	Open source	Linux, Mac		Rewire/ midi enabled
XJ3D	Open source	Windows, Linux, Mac, Solaris		Java-based (Java3d audio handling very buggy).
Cortona3D Viewer	Commercial	Windows	Configuration in SDK	VRML only.
Instantreality	Commercial	Windows, Mac, Linux, IRIX, SunOS	Soundcluster Audio server	OpenSG, OpenGL, AJAX, SOAP
Blaxxun Contact	Commercial	Windows		Focus on multi-user collaboration. Java-based. RealAudio.

Appendix 4: Table 1. X3D browsers overview

Appendix 6. XSLT Code Fragment Walkthrough

X3D-XSLT_Artist_Nodes.xsl

```
<?xml version="1.0" encoding="UTF-8"?>                                <!-- i.e. well-formed XML>

<xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
<xsl:output media-type="model/x3d+xml" doctype-
system="http://www.web3d.org/specifications/x3d-3.2.dtd" method="xml" encoding="UTF-8"
indent="yes" omit-xml-declaration="yes"/>

<xsl:template match="/"> <!-- match the root node of the XML file, in our 'Noise' example
'<artist_nodes>'>

<X3D profile="Immersive">&#10;                                       <!-- create <X3D> root node>
<head>&#10;<title/></head>

<Scene>

<Inline url='ImMapp_Main_Interface.x3d'/>    <!-- add the navigation interface which is
contained in an external X3D file>

  <ExternProtoDeclare name='Layer3D' url='"urn:inet:blaxxun.com:node:Layer3D"
"http://www.blaxxun.com/vrml/protos/nodes.wrl#Layer3D" "nodes.wrl#Layer3D"'>

<ProtoInterface>
  (snip)                                <!-- the navigation interface makes use of the BS-Contact X3D
browser's Layer3D node extension defined as a Prototype node,
the details of which are not important here>
</ProtoInterface>
</ExternProtoDeclare>

<Viewpoint description='Front View' jump='true'
fieldOfView='0.785' position='8.24 54.35 263.86'
orientation='-0.9 0.44 -0.02 0.41'/>    <!-- A number of camera viewpoints
are created allowing easy
navigation of the virtual space>
  <Viewpoint description='First Artist' jump='true'
fieldOfView='0.785' position='-30.79 2.01 159.2'
orientation='-0.1 0.99 0.03 0.95'/>

  (snip)

<NavigationInfo type="GAME" "ANY"/>

<xsl:apply-templates/>    <!-- Once all the nodes of the XML have been traversed and the
final <xsl:apply-templates> node of the XSL has been reached,
create the required closing tags of the X3D world>
</Scene>

</X3D>

</xsl:template>

<!-- The code above simply creates the generic ImMapp environment. The following lines
create elements specific to the 'Noise' content>

<xsl:template match="artist_nodes">    <!-- Find <artist_nodes> in the XML file>

<xsl:for-each select="artist_node [1]">    <!-- Select only the first one '[1]'\>

<Billboard>    <!-- Create three-dimensional 'Billboard' geometry with the following
properties>

<Transform translation='-68 8 180' rotation='-1 0 0 0.9'>    <!-- The billboard's location
(x,y,z co-ordinates), and its
rotation (x,y,z, radians)>

<Shape>    <!-- The Shape and Appearance of the Billboard, in
this case unspecified as it contains only text>
<Appearance>

<Material    <!-- The Billboard's Material is defined>
ambientIntensity='0.2' shininess='0.2'
diffuseColor='1 .5 0'/>

</Appearance>

<Text maxExtent='0.000'>    <!-- The Billboard's content is Text>

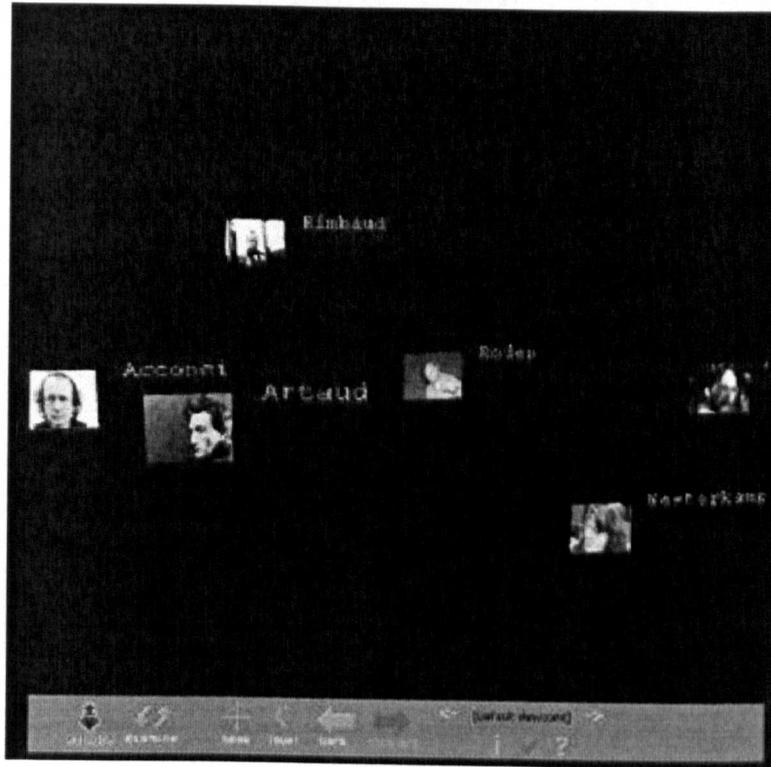
<xsl:attribute name="string">    <!-- The Text string to be displayed
```

```

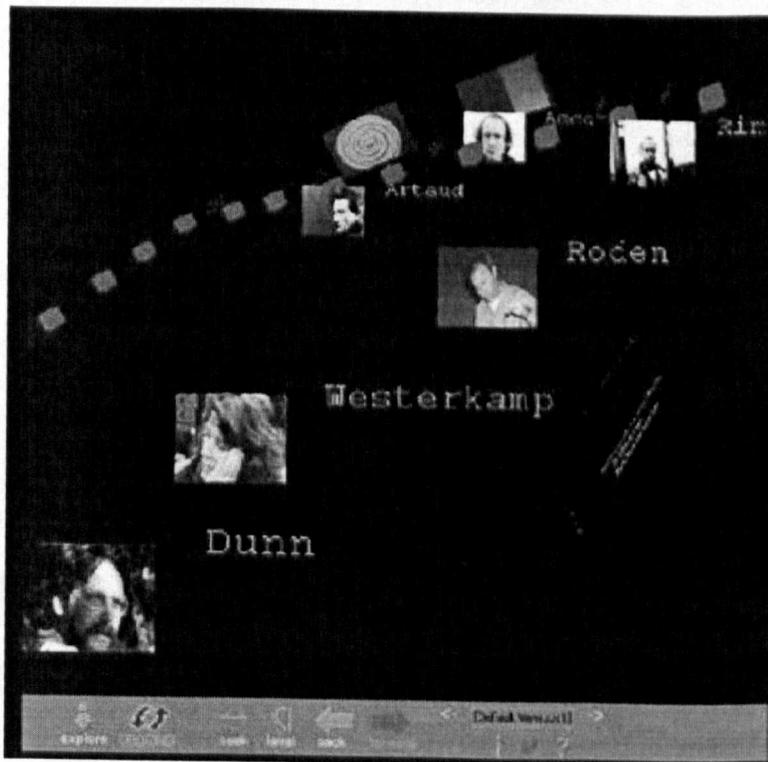
<xsl:text> node: </xsl:text>                                will be 'node:'>
<xsl:value-of select="Node"/>                                <!-- Following 'node:' insert the value found
                                                             in the XML, so we will see node:Noise>
<xsl:value-of select="count(//artist_node)"/>              <!-- Count the number of <artist_nodes
                                                             and add this to the string,
                                                             giving us node:Noise 18>
<xsl:text> artist-functions</xsl:text>                      <!-- Add artist-functions to the text string
                                                             i.e node:Noise 18 artist-functions>
</xsl:attribute>                                           <!-- Close the Text string dynamic attributes>
<FontStyle family='Arial' style='BOLD'                      <!-- Format the text string
justify="BEGIN" "BEGIN" size='10'
spacing='1.000' />
</Text>                                                     <!-- Close the Text X3D node>
</Shape>                                                    <!-- Close the Shape X3D node>
</Transform>                                                <!-- Close the Transform geometry X3D node>
</Billboard>                                               <!-- Close the Billboard X3D node>
...
</xsl:for-each>
</xsl:template>                                           <!-- Close the XSL template>
</xsl:stylesheet>                                         <!-- Close the XSL stylesheet>

```

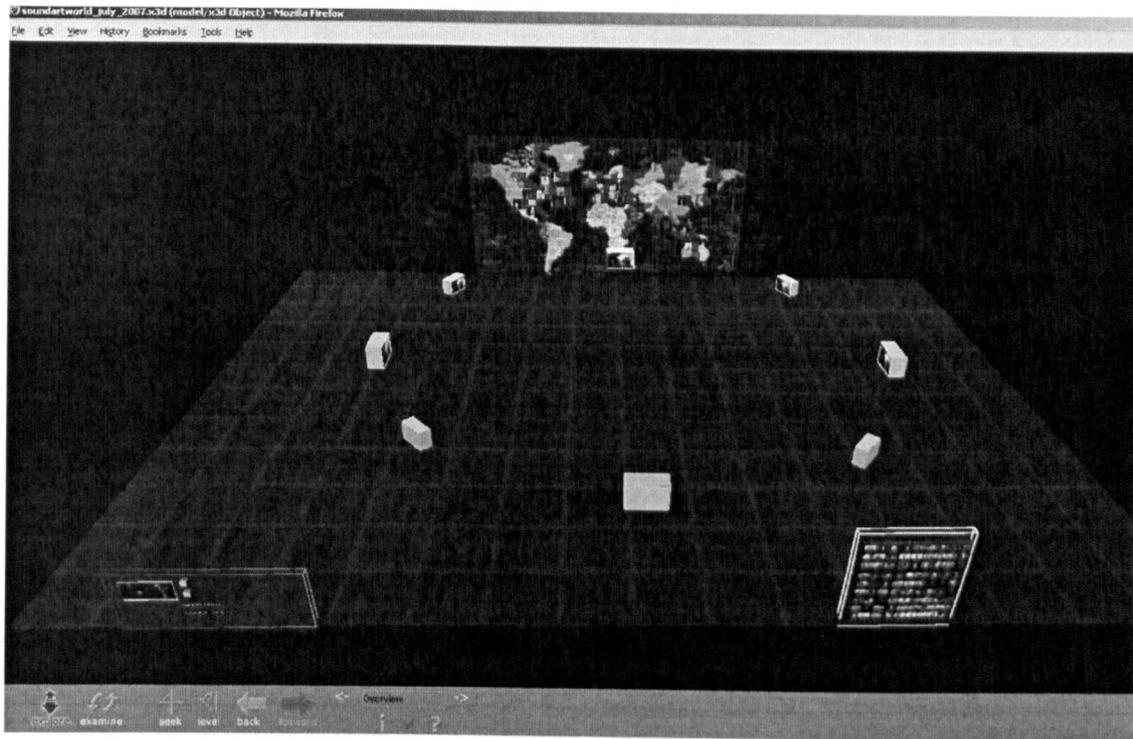
Appendix 7: *ImMApp: Immersion*. X3D Development Screenshots.



Appendix 7: Figure 1. February 2007: *Immersion*.
The earliest experiments with X3D. (*FluxPlayer X3D Browser*).



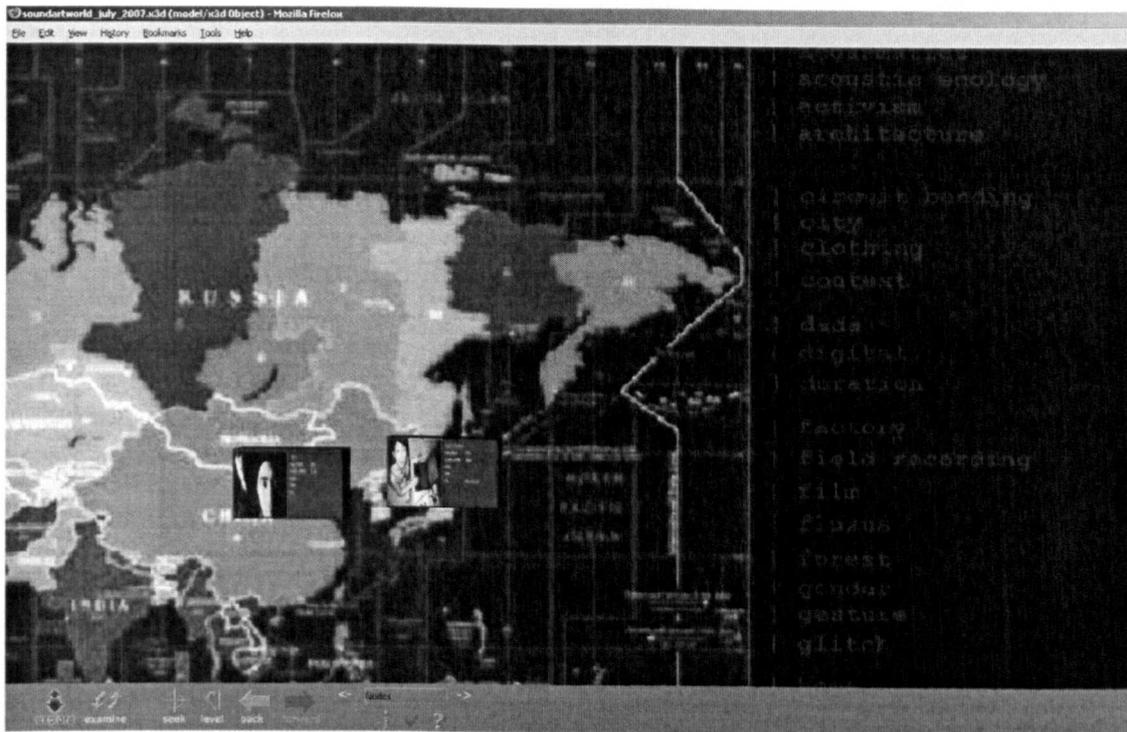
Appendix 7: Figure 2. March 2007: *Immersion*
An early experiment with X3D presenting images, video and showing the *FluxPlayer X3D Browser*'s poor handling of text.



Appendix 7: Figure 3. July 2007: *Immersion*.
Early X3D visualisation of the environment. (*FluxPlayer X3D Browser*).



Appendix 7: Figure 4. July 2007: *Immersion*.
Artist-functions arranged geographically in movable plane geometries. (*FluxPlayer X3D Browser*).



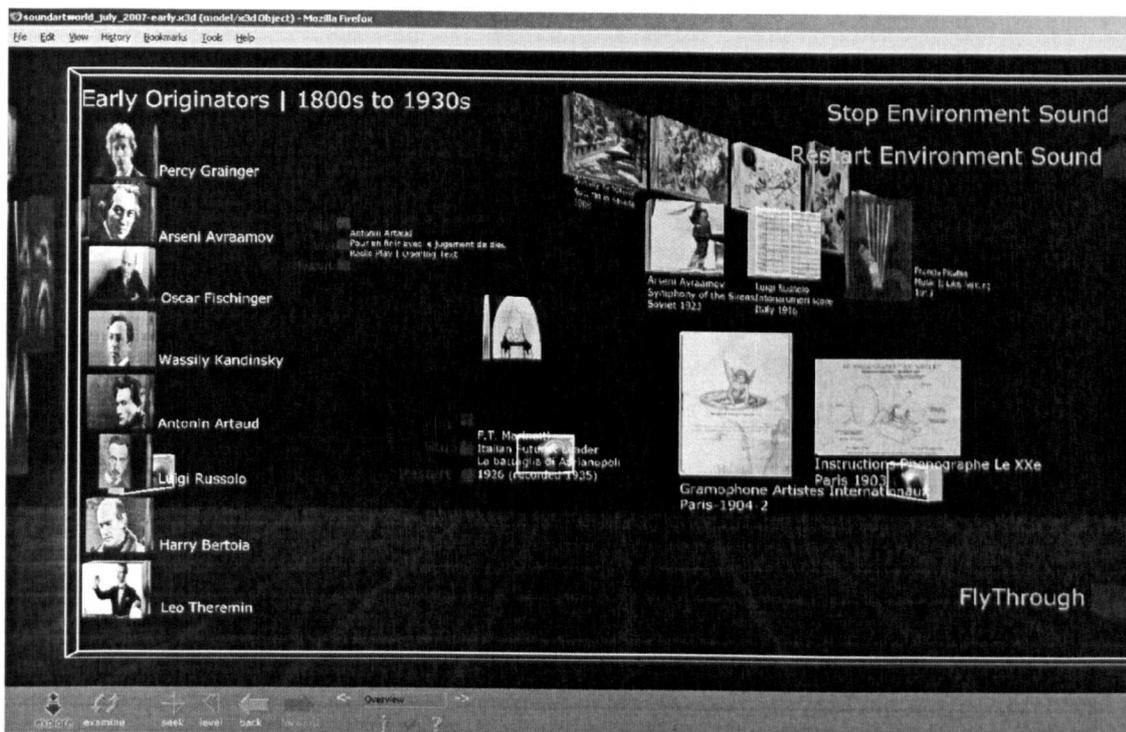
Appendix 7: Figure 5. July 2007: *Immersion*.

A zoom-out from the previous view showing the absence of Asian artist-functions and an early realisation of some principle nodes (right). (*FluxPlayer X3D Browser*).



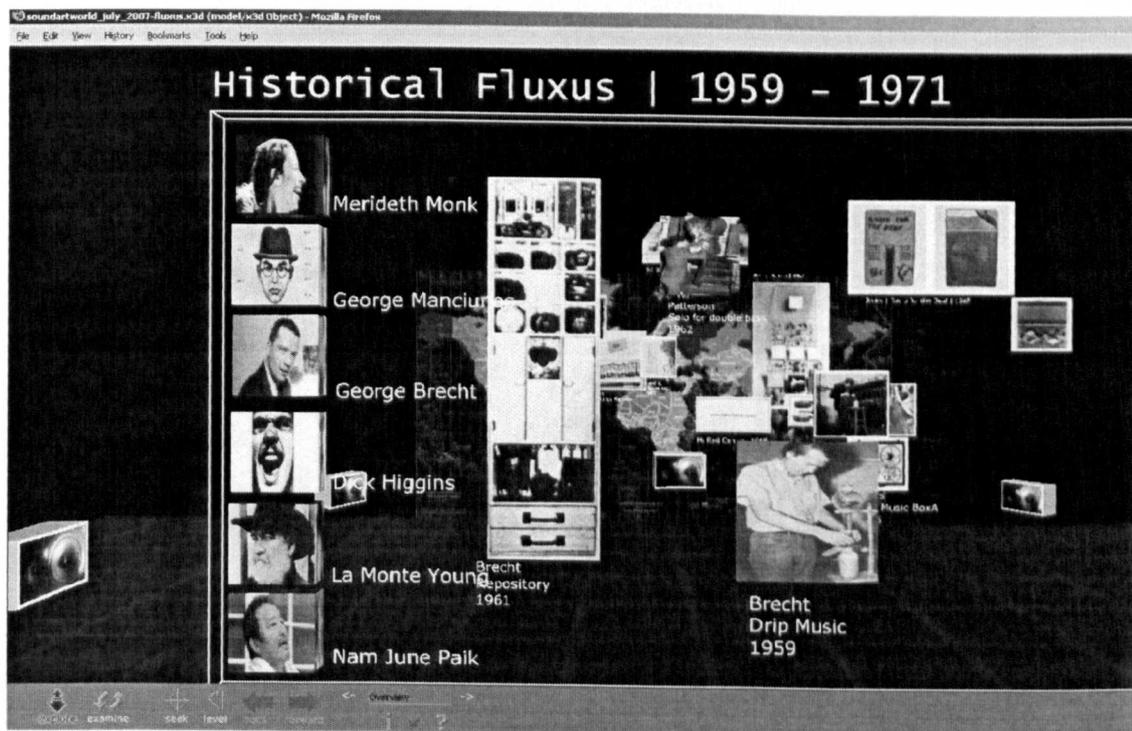
Appendix 7: Figure 6. July 2007: *Immersion*.

Moving back from the previous view showing an experiment with an interface to the *Surface* database. (*FluxPlayer X3D Browser*).



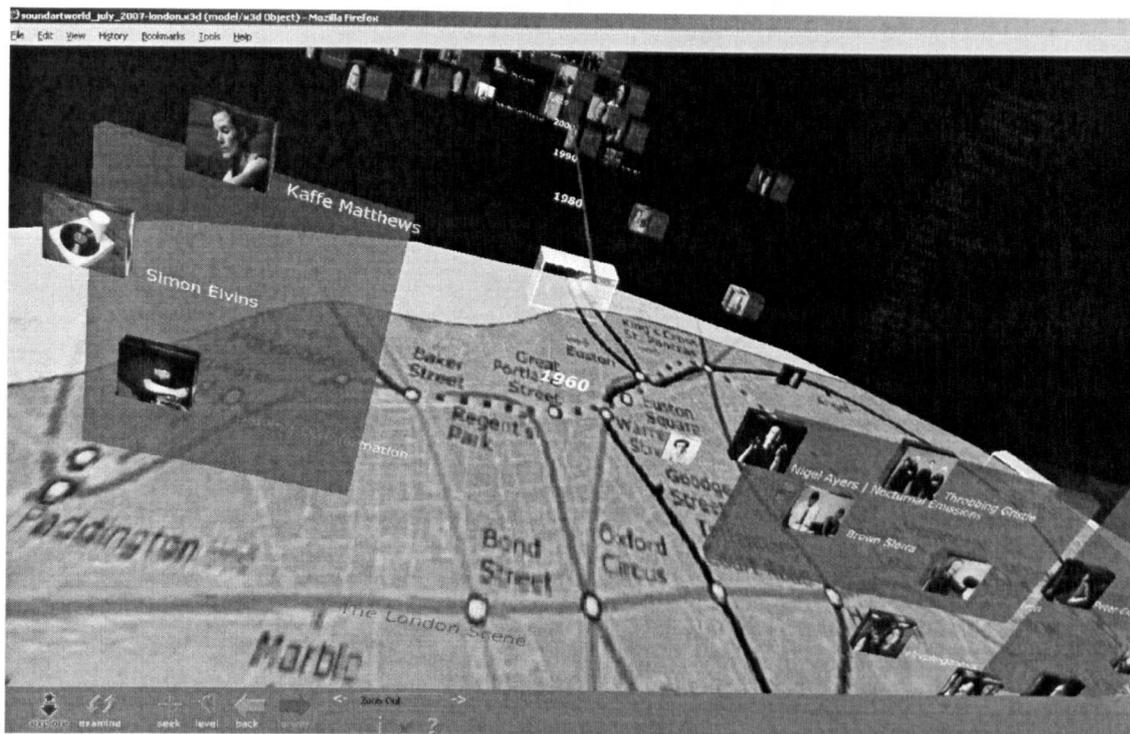
Appendix 7: Figure 7. July 2007: *Immersion*.

An early experiment showing a clustering of artist-functions around “Early Originators 1800’s-1930’s.” (FluxPlayer X3D Browser).

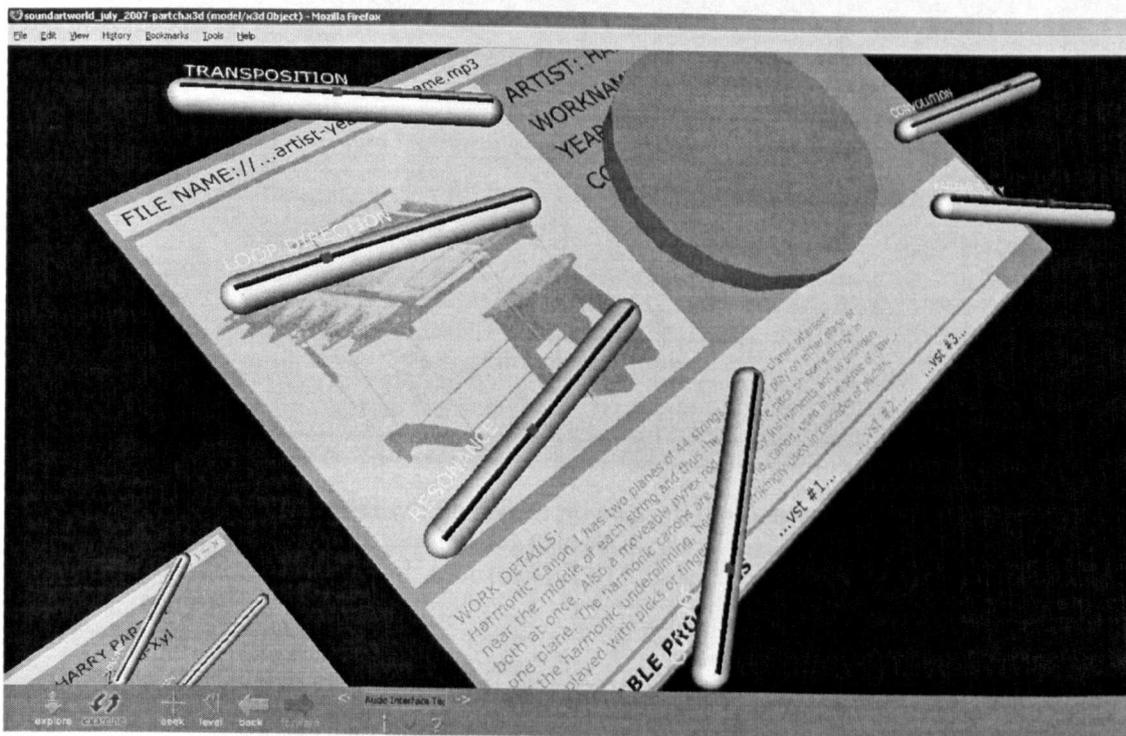


Appendix 7: Figure 8. July 2007: *Immersion*.

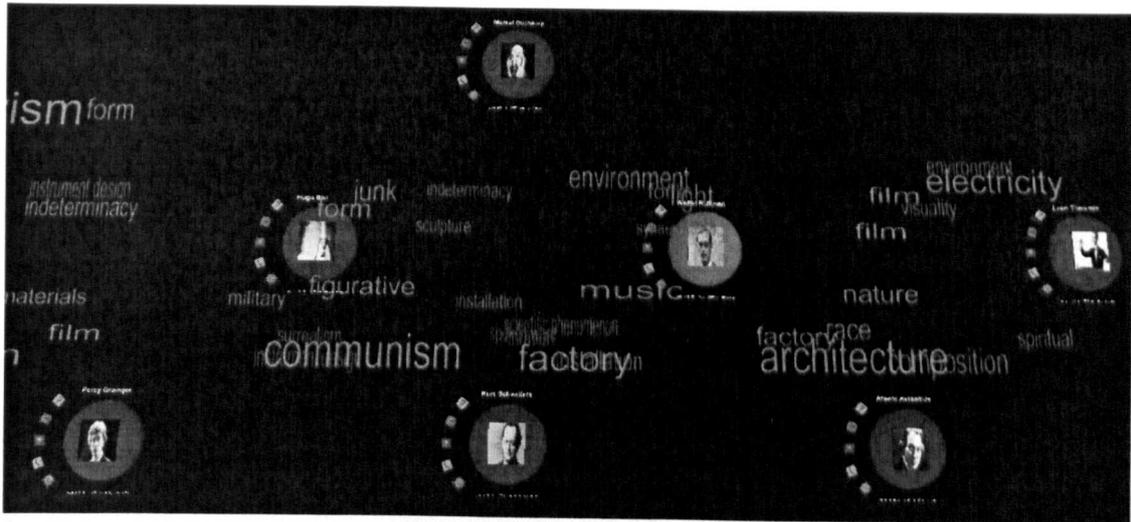
An experiment showing artist-functions proximate to “Historical Fluxus 1959-1971.” (FluxPlayer X3D Browser)



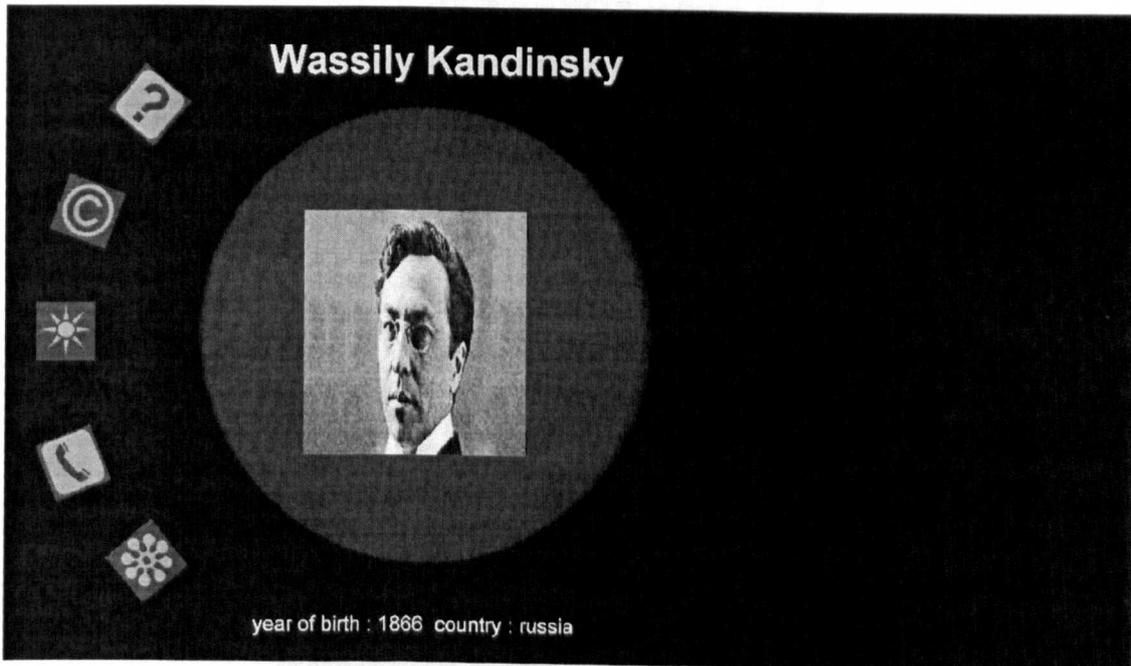
Appendix 7: Figure 9. July 2007: *Immersion*.
 An experiment showing artist-functions based in London. (*FluxPlayer X3D Browser*).



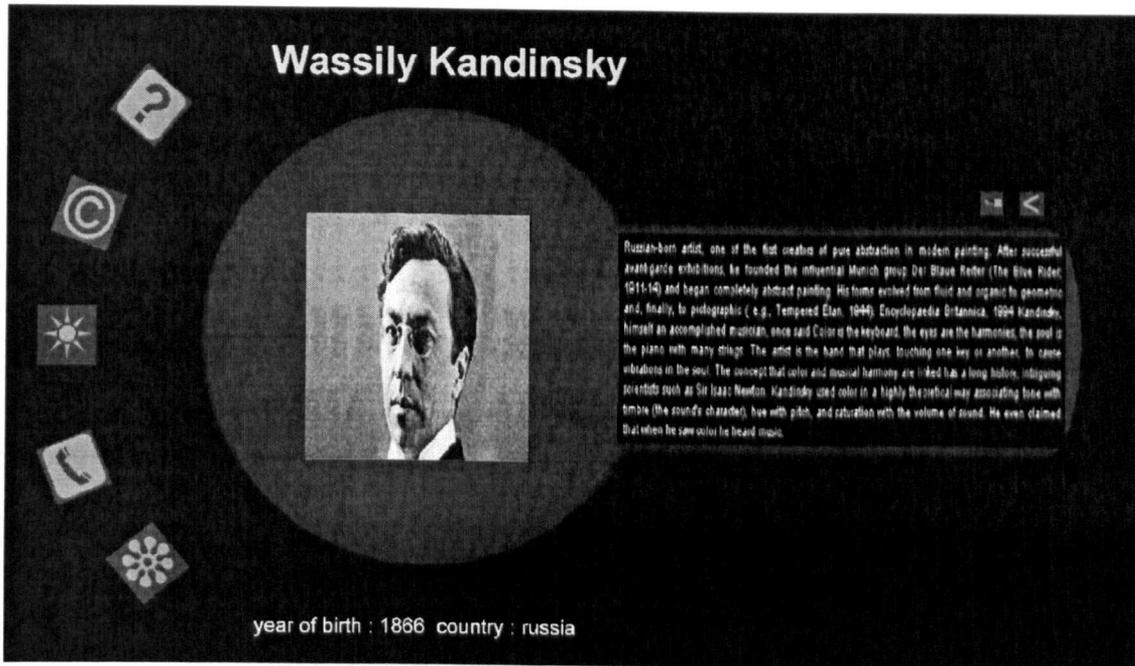
Appendix 7: Figure 10. July 2007: *Immersion*.
 An experimental audio interface based upon Harry Partch's *Harmonic Canon 1*. (*FluxPlayer X3D Browser*).



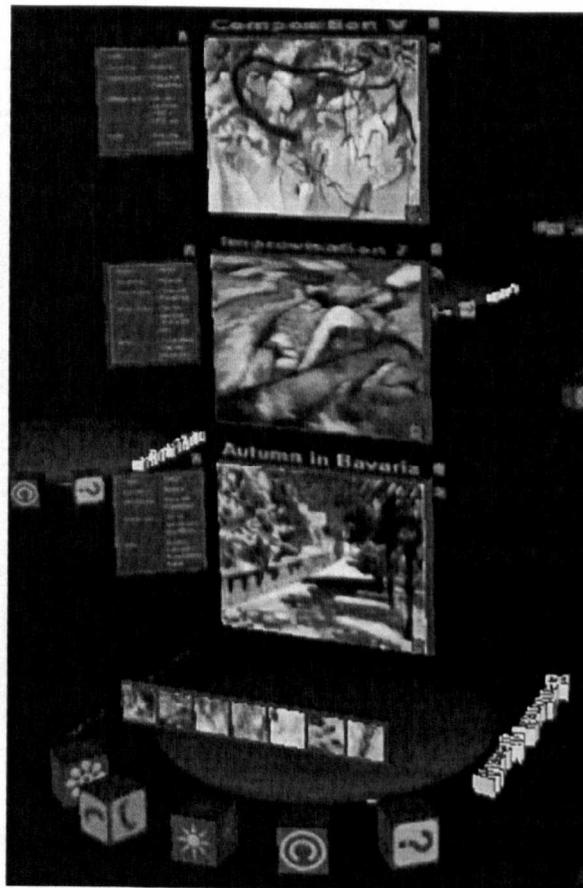
Appendix 7: Figure 11. November 2007: *Immersion*.
 A reworking of “Early Originators 1800’s-1930’s” as presented at the *Digital Archive Fever Conference*, Birkbeck College, Winter 2007. (*FluxPlayer X3D Browser*).



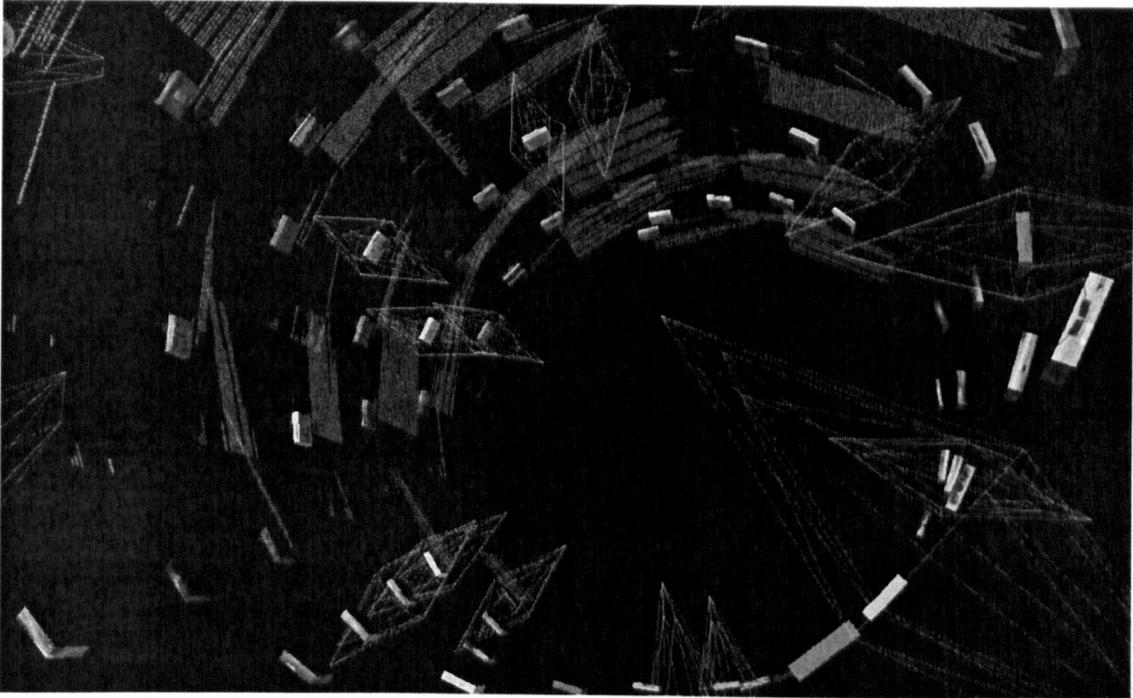
Appendix 7: Figure 12. November 2007: *Immersion*.
 Artist-function Wassily Kandinsky as found in the above version of the environment. (*FluxPlayer X3D Browser*).



Appendix 7: Figure 13. November 2007: *Immersion*.
 Kandinsky's geometry expanded through immersant interaction to reveal further contextual information. (*FluxPlayer X3D Browser*).

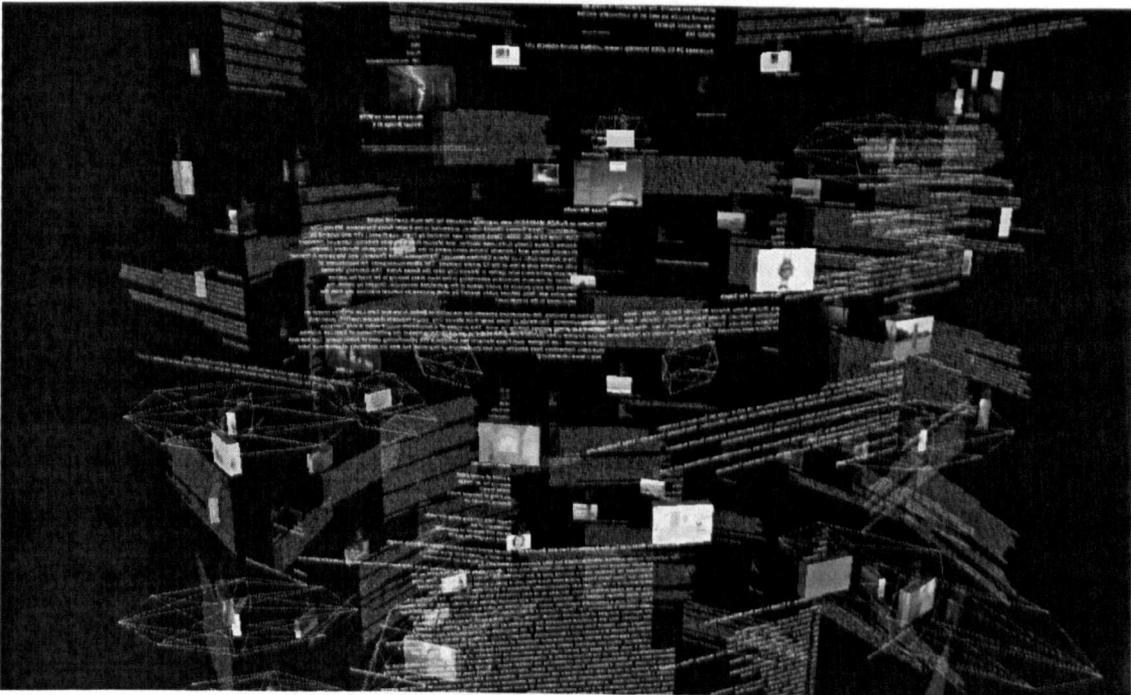


Appendix 7: Figure 14. November 2007: *Immersion*.
 Kandinsky's statements revealed by further interactions with the environment. (*FluxPlayer X3D Browser*).

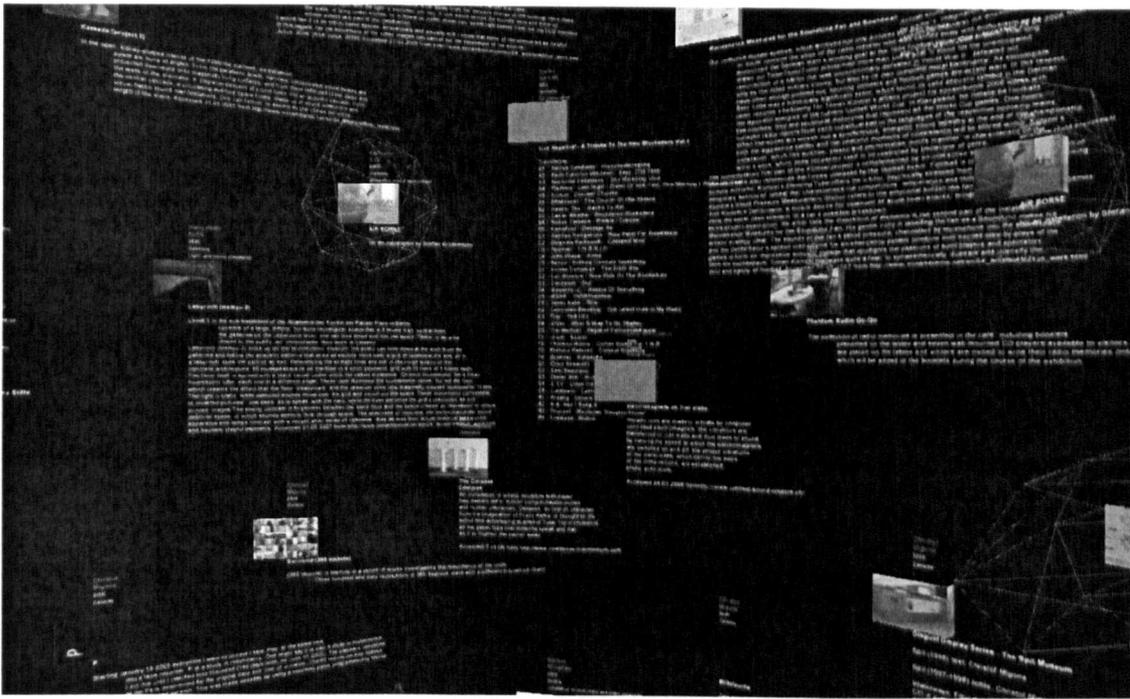


Appendix 7: Figure 17. December 2008: *Immersion*.

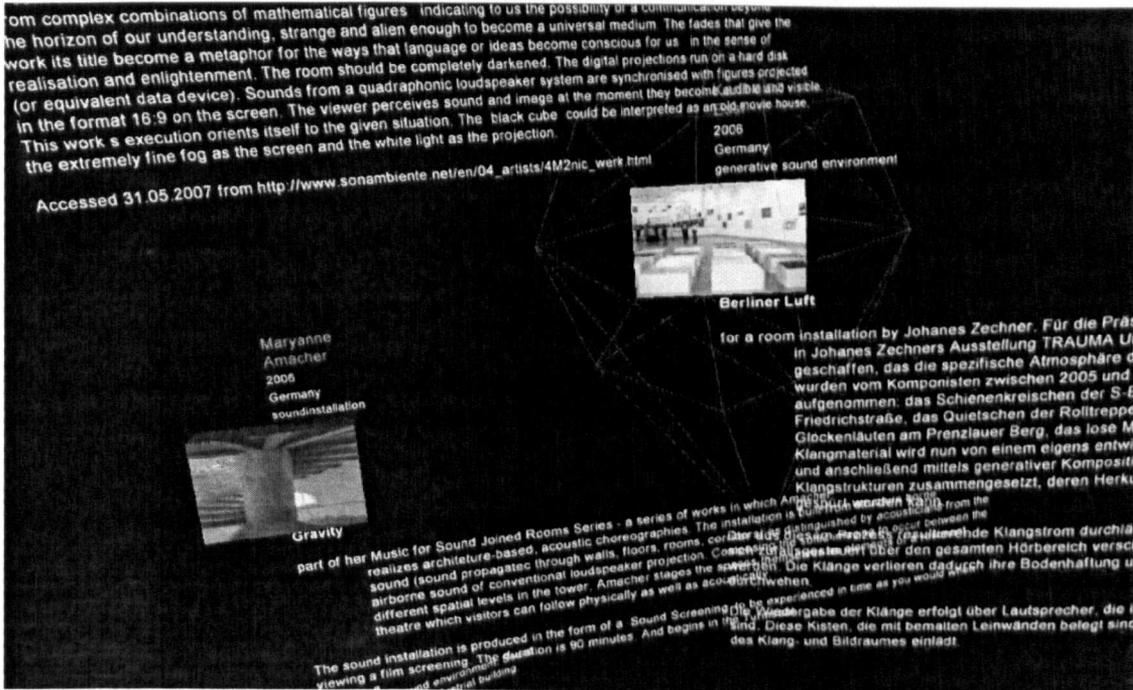
A larger genealogical assemblage presenting selected statements from 2006. (*BS-Contact X3D Browser*).



Appendix 7: Figure 18.



Appendix 7: Figure 19.



Appendix 7: Figure 20.

Appendix 8: Complete List of Conference Attendances, Paper Presentations and Creative Participations

- *Sound and Anthropology* Conference. University of St Andrews, Scotland, 2007.
- *Cybersonica 2006*, Dana Centre, South Kensington, London.
- *Sound & Anthropology Residential Research*, The Burn, Scotland, 2007.

- David Toop's *Unknown Devices: The Laptop Orchestra*. 2007-2009
- *ICMC 07* Copenhagen, Denmark.
Taylor, J. M. (2007a) *Immersion: An Immersive Digital Application for Creative Interaction with Sound Art Archives*. ICMC07, Copenhagen, Re:New.

- *Auditory Cultures* Conference 2007, Copenhagen, Denmark.
- *OpenForm Festival 07*, Oslo, Norway.
- *The Art of Immersive Soundscapes*, University of Regina, Canada, 2007.
- *Performance of Sound Conference*, Tate Britain, May 2007.

- *Atlas of Culture Space* Conference, Korean Institute of Science and Technology, Korea, 2008.
Taylor, J. M. (2008a). *An Immersive Database of Sound Art: Towards a Minor History*. Atlas of Culture Space. Daejeon, KAIST.
- Residency at the *Kunstlerhaus Schloß Balmoral*, Bad Ems, Germany 2008.

- *Prisma Forum 2009*, Oaxaca and Mexico City. Mexico.
- Institutional Visits to *CMMAS* (Mexican Centre for Music and Sonic Arts, Morelia) and *Phonoteca Nacional Sound Archive*, Mexico City, 2009.

Appendix 9: Complete List of Artists' Works Presented on the DVD

Immersion Ontology Node Soundfield Audio Sources

- Singularity Node: Francisco Lopez. *Intolerance* (Spain 1993)
- Subject Positions: Katherine Norman. *You Need a Cab?* (England 2001)
- Institutions and Apparatuses: Giles Gobeil. *Derrière la porte la plus éloginée...* (Canada 1998)
- Materials: Max Neuhaus. *Electronics and Percussion* (USA 1968)
- Concepts: Kim Cascone. *Spectral Space II* (USA)
- Themes: Janet Cardiff and George Bures Miller. *The Missing Voice* (England 1999)
- Techniques: Camille Norment. *Kanzas* (USA 2003)
- Paradigms: Iain Mott. *Sound Mapping* (Australia 1998)
- Surfaces of Emergence: Christof Migone. *Un Jeudi Téléphonique* (Canada 1998)
- Practices: Warren Burt. *Pythagoras Babylonian Bathtub* (Australia 2003)
- Strategies: Gordon Monahan. *When It Rains* (Canada 2003)
- Canons: Brandon LaBelle. *Transient Definitions* (USA 2001)

Surface and Immersion Material: (Listed by Artist Surname)

- Anonymous. *Automatic Music Player* (Sound Object. Arabia 1200. Duttman, W. and U. Eckhardt (1980).
Für Augen und Ohren Exhibition Catalog. Berlin, Akademie der Kunste).
- Auinger, Sam. *Balance 1.0* (Installation. Germany 1996)
- Ayers, Nigel. *Tissue of Lies* (LP. England 1981)
- Ayers, Nigel. *Fruiting Body* (LP. Sterile Records ION2 LP. England 1981)
- Avraamov, Arseni. *Symphony of Factory Sirens* (Performance. USSR 1923)
- Bandt, Ros. *The Sound Playground* (Installation. Australia 1981)
Voicing the Murray (Installation. Australia 1996)
- Barron, Louis and Bebe. *Forbidden Planet* (Soundtrack. USA 1956)
- Baschet, François and Bernard. *3 Octave* (Sounding Sculpture. France 1956)
- Bennet, Vicki. *Story Without End* (Video Collage. England 2005)
People Like Us Jingle (Audio Collage. England 2001)
- Burt, Warren. *Aardvarks IV* (Noise Composition. Australia 1972)
Nocturnal B (Video. Australia 1977)
SoundBath (Live Performance Recording. Australia 1979)
Lo Fi Melodic Electronics 1979-81 (Lo Fi Plunderphonics. Australia 1981)
Still for Eva - Dawn II (Sound for Dance. Australia 1981)
In Memoriam Bill Evans (Video. Australia 1982)
In the Solomans (for Bill Viola) (Composition. Australia 1982)
Almond Bread Harmonies II (Experimental Composition. Australia 1985)
Not for Public Consumption (Sound Collage. Australia 1988)
24 Chorales for Chris Mann (Algorithmic Composition. Australia 1991)
Warren Burt: Texts and Music 1987-1998 (CD. Australia 1998)

- Miss Furr and Miss Skene* (Voice Piece. Australia 1998)
- Playing in Traffic* (Composition. Australia 2001)
- Paul Panhuysen/Warren Burt: Number Made Visible Made Audible* (Soundscape. Australia 2001)
- Pythagoras Babylonian Bathtub* (Live Recording. Australia 2003)
- 5 Unconventional Realizations for Ruark Lewis* (Video. Australia 2006)
- Cardew, Cornelius. *Memorial Concert First Movement* (Composition/Performance. England 1985)
- Chartier, Richard. *Camera Lucida: Sonochemical Laboratory* (Installation. Turkey 2009)
- Chesworth, David and Leber, Sonia. *The Master's Voice* (Installation. Australia 2001)
- Cusack, Peter. *Day for Night* (CD. England 2000)
- Dunn, David. *Skydrift* (Environmental Performance. USA 1977)
- Chaos and the Emergent Mind of the Pond* (Soundwork. USA 1999)
- Finer, Jem. *Longplayer* (Installation. England)
- Score for a Hole in The Ground* (Outdoor Installation. England)
- Longplayer Live* (Performance. England 2009)
- Water and Birds* (Soundwork. England 2008)
- Garrelfs, Iris. *Symbiosis* (Performance. Italy 2005)
- Gobeil, Giles. *Le Vertige Inconnu* (Electroacoustic Composition. Canada 1994)
- La Ville Machine* (Electroacoustic Composition. Canada 1992)
- Gregory, Ken. *wind coil sound flow* (Installation. Canada 2009)
- Harrison, Jonty. *...et ainsi de suite* (Electro-acoustic Composition. England 1992)
- Heimbecker, Steve. *Windwaterwall* (Installation. Canada 2004)
- Hinterding, Joyce. *The Levitation Grounds* (Installation. Australia 2000)
- House 2 – The Great Artesian Basin* (Installation. Australia 20003)
- Jeck, Philip. *Off the Record* (Installation/Performance. England 2000)
- Kandinsky, Wassily. *Composition VII* (Experimental Composition. USSR 1913)
- Composition VIII* (Experimental Composition. USSR 1923)
- Kubisch, Christina. *Tea Time (Autumn Leaves Mix)* (Soundwork. England 2008)
- McGinley, Patrick.
- eyes like a fish part 1:3* (sagita recordings. England 2002)
- rumer* (excerpt) (From the album .murmer. bake records. England 2002)
- framework 1* (Unreleased Soundwork. England 2002)
- the garden* (Unreleased Soundwork. England 2002)
- oracle extended* (excerpt) (England 2003)
- untitled* (william english) (Unreleased Soundwork. England 2003)
- binaural haircut, london, 10.2003* (Unreleased Soundwork. England 2003)
- Buzzing Intercom, Gospel Oak* (Field Recording. England 2003)
- they were dreaming they were stones* (ground fault. England 2004)
- elements* (ground fault. England 2004)
- Migone, Christof. *Solar Plexus* (Audio Work. Canada 1994)
- Mott, Iain. *Summoned Voices* (Installation. Australia 2003)

Mowson, Bruce. *BIRDLAND* (3D Digital Sound. Australia 2009)

Negativland. *Escape from Noise* (LP. USA 1987)

Neuhaus, Max. *Drive-In Music* (Installation. USA 1967)

Times Square (Installation. USA 1977)

Radio Net (Network Performance. USA 1977)

Norman, Katherine. *Losing it (excerpt)* (Composition. England)

Trying to translate (Composition. England 199)

In her own time (Composition. England 1992)

Trilling Wire (Composition. England 1994)

Bells and Gargoyles (Digitally-created soundscape. England 1996)

[b]-contained (Composition. Ireland 2000)

Anything from the minibar? (Short computer-processed soundscape. England 2001)

Something Quite Atrocious (Short computer-processed soundscape. England 2001)

You need a cab? (Short computer-processed soundscape England 2001)

Norment, Camille. *Notes from the Undermind* (Architectural Sound Installation. USA 2001)

Oldorp, Andreas. *The Breakwater Organ* (Unrealised Installation Proposal. Wales 2009)

Paine, Garth. *Reeds* (Installation. Australia 2000)

Riches, Martin. *The Talking Machine* (Germany 1989)

Roden, Steve. *Moonfield* (Installation. Germany 2002)

Rose, Jon. *The Fence* (Radio Work/Performance. Germany 1998)

Sato, Minoru. *contact eletrcity noise* (Installation. Australia 1990)

Schaffer, R Murray. *The New Soundscape* (Book. Canada 1968)

Schaeffer, Pierre. *Symphonie Pour Un Homme Seul* (Tape Composition. France 1949)

Schwitters, Kurt. *Merz-Column* (Merzwurk. Germany 1923)

Senn, Dan. *Water-driven Canopy Lyre* (Installation. USA 1997)

The Odradek Complex (Installation. Czech Republic 2006)

Smalley, Denis. *Sources/scènes* (CD. Canada 2000)

Stockhausen, Karlheinz. *Hymnen* (Tape Composition. Germany 1964)

Helicopter String Quartet (Composition. France 1991)

Toop, David. *Waxed Skin* (England)

Trimpin. *Liquid Percussion* (Installation. USA 1991)

Truax, Barry. *Prospero's Voyage* (Tape Composition. Canada 2004)

Chalice Well (Soundscape Composition. Canada 2009)

Watson, Chris. *Interview (excerpt)* (England 2003)

Westerkamp, Hildegard. *Beneath the Forest Floor* (Soundscape Composition. Canada 2001)

Whitehead, Gregory. *If a Voice Like, Then What* (Voice Cut-up, USA 1984)

The Bone Trade (Radiophonic work, England 1998)

Worrall, David. *I am on the Net* (Network and Sound Installation. 2005 Australia)

Z, Pamela. *Badagada* (Composition/Performance. USA 1988)

Bibliography

- Andersen, B., Erharter, Neset, Mokkelbost, Hiorthoy (2005) Sonic North, Office for Contemporary Art, Norway.
- Andersen, N. A. (1986) Phonic sculpture: mechanically actuated musical instruments in a sculptural context. *Leonardo* 19(2): 99-106.
- Anslow, C. (2007b) Evaluating X3D For Use in Software Visualisation, <http://www.mcs.vuw.ac.nz/>.
Master's Thesis.
- Anslow, C., J. Noble, et al. (2007a) X3D Software Visualization. Proceedings of the New Zealand Computer Science Students Research Conference.
- Aquarius_Records. (2000) Halim El-Dabh: Crossing into the Electric Magnetic. from <http://www.aquariusrecords.org/bin/search.cgi/keyword=eldacroscd>.
- Ashton, D., Celant G. (1981) SOUNDINGS, Neuberger Museum.
- Attali, J. (1985) Noise - The Political Economy of Music, University of Minnesota Press.
- Augaitis, D., Lander, D., Ed. (1994) Radio rethink: art, sound and transmission - selected survey of radio art in Canada, 1967-1992. Banff, Alberta:, Walter Phillips Gallery, Banff Centre.
- Bailey, D. (1980) Improvisation, its nature and practice in music, Moorland Publishing.
- Ballay, J. M. (1994) Designing Workscape: An Interdisciplinary Experience. CHI '94, ACM.
- Bandt, R. (1985) Sounds in Space, Wind Chimes and Sound Sculptures, Victorian Arts Council, Australia.
- Bandt, R. (2000) Sounding spaces, acoustic world: Australian sound designs. *Public Art Review* 11(2): 23-6.
- Bandt, R. (2003) Taming the wind: Aeolian sound practices in Australasia. *Organised Sound* 8: 195-204.
- Bandt, R. (2005b) Designing Sound in Public Space in Australia: a comparative study based on the Australian Sound Design Project's online gallery and database. *Organised Sound* 10: 129-140.
- Bandt, R., Paine, G. (2005a) The Australian Sound Design Project. from <http://www.sounddesign.unimelb.edu.au/site/about.html>.
- Banks, J. (2001) Rorschach Audio: Ghost Voices and Perceptual Creativity. *Leonardo Music Journal* 11: 77-83.
- Baschet, B. and F. Baschet (1987) Sound sculpture: sounds, shapes, public participation, education. *Leonardo* 20(2): 107-14.
- Behr, J., Dähne, P., Roth, M. (2004) Utilizing X3D for immersive environments. Web3D '04: Proceedings of the ninth international conference on 3D Web technology, Monterey, California.
- Behrendt, F. (2006) Sound Art on the Move. SoundasArt Conference, University of Aberdeen.
- Benjamin, W. (1969) Franz Kafka. Illuminations. H. Arendt. New York, Schocken Books.
- Bennett, M. V. (1985) Sounded, sounding, to sound: sound and the seduction of the visual artist. *High Performance* 8(3): 34-8.
- Bilasco, I. M., Gensel, J., Villanova-Oliver, M., Hervé, M. (2007) Towards Geospatial Queries in a Semantic Digital Library for 3D Data. *Transactions in GIS* 11(3): pp. 337-353(17)
- Blessner, B., Salter, Linda-Ruth (2007) Spaces Speak, are you listening? Cambridge, MA, MIT Press.
- Bregman, A. (1994) Auditory Scene Analysis: The Perceptual Organization of Sound, MIT.
- Brutzman, D. (2001) X3D issues for XSLT, from XSL group meeting 27 FEB 2001. Extensible Stylesheet Language (XSL) working group meeting -Stylus Studio.
- Brutzman, D. (2001) XML Tool Relationships for X3D. from <http://www.web3d.org/x3d/content/XmlToolRelationshipsForX3d.pdf>.
- Brutzman, D. (2003) X3D-Edit: Authoring Tool for Extensible 3D Graphics. Web3D Symposium Web3D Symposium 2003, Saint Malo, France.
- Brutzman, D. (2007) Extensible 3D (X3D) Earth Technical Requirements Workshop Summary Report. Monterey, California, Naval PostGraduate School.
- Brutzman, D. and L. Daly (2007) X3D Extensible 3D Graphics for Web Authors. San Francisco, Morgan Kaufman.
- Buchla, D., P. Oliveros, et al. (1994) Electronic Music Foundation.
- Bull, H. (1993) Radio Art in a Gallery? . *TDR* (1988-) Vol. 37(1): pp. 161-166.
- Bull, H. and R. Adrian. (1979) Sound On - Audio Scene '79 at Modern Art Galerie, Vienna. Retrieved May 15th, 2006.
- Bull, M., Black, L., Ed. (2004) The Auditory Culture Reader, Berg.
- Cabral, M. (2007) An experience using X3D for virtual cultural heritage. 3D technologies for the World Wide Web Proceedings of the twelfth international conference on 3D web technology.
- Cardiff, J., Bures Miller, G. (2008) The House of Books Has No Windows. Edinburgh / Oxford, The FruitMarket Gallery & Modern Art
- Carlson, J. (2008) Re: [x3d-public] Ontology of UI controls, properties and states. Volume, DOI:

- Chen, P.-L., Li, Tsai-Yen (2005) Realising Emotional Autonomous Virtual Agents in a Multi-user Virtual Environment.
- Chittaro, L., Ranon, R.; (2003) Adaptive Hypermedia Techniques for 3D Educational Virtual Environments. from http://www.computer.org/portal/cms_docs_intelligent/intelligent/homepage/2007/X407/x4031.pdf
- Coelho, A. F., Sousa, A. A., Ferreira, F. N. 3D Modelling of Large Urban Scenes from Diverse Sources of Information. from <http://elpub.scix.net/data/works/att/0335.content.pdf>.
- Cohen, K., J. Elkins, et al. (1997) Digital Culture and the Practices of Art and Art History. *The Art Bulletin* 79(2): 187-216.
- Conomos, J. (1995) Sound in space. *Art and Australia* 33: 283-4.
- Cox, C. (2003) Return to form: Christoph Cox on neo-modernist sound art. *ArtForum*.
- Cox, C. (2004) Audio Culture - Readings in Modern Music, Continuum International Publishing Group Ltd.
- Cox, C. (2006) Reverb Time. *Artforum International* 45(1): 89-90.
- Cranfield, B. (2002) Producing Noise: Oval and the Politics of Digital Audio. *Parachute*(107): 42-51.
- Crowe, N. (2002) Bandwagon Jumping: The International 3, Manchester. *Art Monthly*(262): 35-6.
- Cunningham, D. (2000) Sonic boom: Hayward Gallery, London. *Art Monthly*(237): 34-6.
- Dachselt, R., Hinz, M., Pietschmann, S.; (2006) Using the Amacont Architecture for Flexible Adaptation of 3D Web Applications. *Web3D '06*.
- Davidson, J. D. (2000) Apache Ant.
- Davies, C. (2003) Rethinking VR: Key Concepts and Concerns. *Hybrid Reality: Art, Technology and the Human Factor*. H. Thwaites. Montreal, Canada, International Society on Virtual Systems and Multimedia: pp. 253 - 262, illus.
- Davies, C. (2004) Virtual Space. *Space, In Science, Art and Society*. F. Penz, Radick, G and Howell, R. Cambridge, Cambridge University Press: pp 69-104.
- Delehanty, S., Ed. (1980) *Soundings*. New York, Neuberger Museum, State University of New York.
- Deleuze, G. (1989) *Cinema 2: The Time-Image*, University of Minnesota Press.
- Deleuze, G. and F. Guattari (1986) *Kafka: Towards a Minor Literature*. Minneapolis / London, University of Minnesota Press.
- Deleuze, G. and F. Guattari (1987) *A Thousand Plateaus: Capitalism and Schizophrenia*, University of Minnesota Press.
- Deleuze, G. and F. Guattari (1996) *What is Philosophy?*, Columbia University Press
- Diamond, S. (2002) *Code Zebra*. Accessed 29th January 2010. <http://www.codezebra.net>
- Doruff, S (2006) *The Translocal Event and the Polyhythmic Diagram*. PhD Dissertation. UAL, UK
- Drobnick, J., Ed. (2004) *Aural Cultures*.
- du Boulay, D. Virtual Instrument Representation in X3D and some CIF->XML stuff. from http://mmsn.net.au/events/ANSTO_MMSN_ws2_Dec_2006/ANSTO_MMSN_ws2_Dec1406_DdB.pdf.
- Duguid, B. (1998) *Sound By Artists* (review) from <http://media.hyperreal.org/zines/est/reviews/bookrevs.html#vanpeer>.
- Dunn, D. (2001) *Nature, Sound art & the Sacred*. *The Book of Music and Nature*. D. Rotherberg, Wesleyan University Press.
- Duttman, W. and U. Eckhardt (1980) *Für Augen und Ohren*. Berlin, Akademie der Kunste.
- Dyson, F. (2004) *A Philosophonics of Space: Sound, Futurity and the End of the World*.
- Elektra (2005) *Her Noise*, London.
- Eliens, A. (2007) *3D Digital Dossiers – a new way of presenting cultural heritage on the Web*. *Web3d 2007*, Perugia, Italy.
- England, P. (1993) *Sound by Artists* (review) *Variet*: 43.
- Erlmann, V., Ed. (2004) *Hearing Cultures: Essays on Sound, Listening and Modernity*. New York, Berg Publishers.
- Fabre, Y. (2003) A framework for mobile-agents embodied in X3D networked virtual environment. *Web3D '03: Proceeding of the eighth international conference on 3D Web technology*, Saint Malo, France.
- Flynt, H. A. (1961) *Anthology of Non-Philosophical Cultural Works*. An Anthology. L. Young. New York, Heiner Friedrich.
- Föllmer, G. (2005) Lines of Net Music. *Contemporary Music Review* 24(no.6): pp. 439-444.
- Foucault, M. (1961) *Madness and Civilization: A History of Insanity in the Age of Reason*. London: , Tavistock 1965.
- Foucault, M. (1963) *Naissance de la clinique - une archéologie du regard médical*. Paris, PUF.
- Foucault, M. (1972) *The Archaeology of Knowledge*, Routledge.
- Foucault, M. (1974) *The Order of Things: An Archaeology of the Human Sciences*, Routledge.

- Foucault, M. (1975) *I, Pierre Riviere, having slaughtered my mother, my sister, and my brother...(A Case of Parricide in the 19th Century)*, University of Nebraska Press.
- Foucault, M. (1976) *The History of Sexuality: Vol I: The Will to Knowledge*. Paris, Gallimard.
- Foucault, M. (1984a) *The History of Sexuality: Vol II: The Use of Pleasure*. Paris, Gallimard.
- Foucault, M. (1984b) *The History of Sexuality: Vol III: The Care of the Self*. Paris, Gallimard.
- Frank, P. (1982) Soundings at SUNY Art Journal 42(1): pp. 58-62.
- Furlong, W. (1973) *Audio Arts*.
- Geiger, R. (2008) *The Wikipedian Discourse: A Foucauldian Archaeology of Power Relations*. NCA 94th Annual Convention. San Diego, CA.
- Gere, C. (2002) *Digital Culture*. London, Reaktion Books.
- Geroimenko, V. and C. Chen, Eds. (2005) *Visualising Information Using SVG and X3D*. London, Springer.
- Gervasi, O., Tasso, S. ; Laganà, A. (2006) *Immersive Molecular Virtual Reality Based on X3D and Web Services*. Computational Science and Its Applications. Berlin / Heidelberg, Springer
- Gibbs, T. (2007) *The Fundamentals of Sonic Art & Sound Design*. Lausanne, AVA Publishing.
- Glandien, K. (2001) Sound Art discourse in England *Ars Acoustica* - EBU plenary meeting, BBC
- Goldsmith, K. (1996) *UbuWeb*. from <http://www.ubu.com/>.
- Gorisse, N. (2000) *CPS*. from <http://cps.bonneville.nl/>.
- Grau, O. (1999) Into the Belly of the Image: Historical Aspects of Virtual Reality. *Leonardo* Vol. 32(5): pp. 365-371.
- Guattari, F. B., Paul (1995) *Chaosmosis: An Ethico-Aesthetic Paradigm*.
- Hall, S. (2001) Constituting an archive. *Third Text* (U.K.), no. 54 Spring pp. 89-92, bibliog.
- Hammer, E. (2006) Sound art. (*Lydkunst*) *Art Review* 6: p. 102-3.
- Harris, M. (1998) *Noises Off*. *Art Monthly*(219): pp 1-5.
- Harten, J. (1975) *Sehen um zu Hören*. Düsseldorf, Städtische Kunsthalle Düsseldorf / Jean Esser KG.
- Havelock, E. A. (1986) *The Muse Learns to Write: Reflections on Orality and Literacy from Antiquity to the Present*. New Haven, Yale University Press.
- Hegarty, P. (2007) *Noise Music: A History* Continuum International Publishing Group Ltd.
- Heimbecker, S. (2005) *Songs of Place*. Montreal, Oboro.
- Higgins, D. (1965) *Synaesthesia and Intersenses-Intermedia*. *Something Else Newsletter* 1, .
- Ieronutti, L., Ranon, R., Chittaro, L. (2004) Automatic derivation of electronic maps from X3D/VRML worlds. *Web3D '04: Proceedings of the ninth international conference on 3D Web technology*, Monterey, California.
- Ilic, D. (1994) *Extreme Noise Terrors*. *The Wire*.
- Imada, T. (2003) *Acoustic Ecology Considered as a Connotation: Semiotic, Post-colonial and Educational Views of Soundscape*. *Acoustic Ecology: An International Symposium, World Forum for Acoustic Ecology Melbourne*.
- Innis, H. (1950) *Empire and Communications*. Oxford, Clarendon Press.
- Jensen, E. G., LaBelle, Brandon Ed. (2006) *Radio Territories Errant Bodies*.
- Jianghui Ying; Gracanin, D. C.-T. L. (2004) *Web visualization of geo-spatial data using SVG and VRML/X3D*. *Image and Graphics, 2004. Proceedings. Third International Conference on*.
- Joseph, B. W. (2008) *Beyond the Dream Syndicate: Tony Conrad and the Arts after Cage*. New York, Zone Books.
- Kahn, D. (1993) *The Latest: Fluxus and Music*. *Spirit of Fluxus Catalogue*, Walker Art Center.
- Kahn, D. (2001) *Noise Water Meat*, MIT Press.
- Kahn, D. (2006) *Sound Art, Art, Music*. Retrieved 28th April 2006.
- Kahn, D., Whitehead, G., Ed. (1992) *Wireless Imagination, Sound, Radio and the Avant-Garde*, The MIT Press.
- Kangas, M. (1996) *SoundCulture* 96. *Sculpture* 15: 60.
- Kay, M. (2007) *Saxon 9.1.0.5*. from <http://saxon.sourceforge.net/>.
- Kendall, G., Wickham, Gary (1999) *Using Foucault's Methods*. London, Sage.
- Kirdec, C. (2009) *The African and Asian Alternative Database*. from http://www.3point5.be/syrphe/african&asian_database.htm.
- Kubisch, C. (2000) *KlangRaumLichtZeit*. Heidelberg, Kehrer.
- LaBelle, B. (2006) *Background Noise: Perspectives on Sound Art*, Continuum.
- LaBelle, B. (2007) *Artist's Bio*. Austria.
- LaBelle, B., Roden, Steve, (2005b) *Site of Sound: Of Architecture and the Ear, Errant Bodies*.
- Lander, D. (1990) *Sound by Artists*. Toronto, Art Metropole & Walter Philips Gallery.
- Lash, S. (2002) *Critique of Information*. London, Thousand Oaks, New Delhi, SAGE.
- Latour, B. (1987) *Science in Action: How to Follow Engineers in Society*. Milton Keynes, Open University Press.

- Levinson, P. (1999) *Digital McLuhan: A Guide to the Information Millenium*. New York, Routledge.
- Licht, A. (2007) *Sound Art: Beyond Music, Between Categories*, Rizzoli; Har/Com edition.
- Liu, Q., Sourin, A. (2006) *Function-based Shape Modelling and Visualization in X3D*. Web3D '06: Proceedings of the eleventh international conference on 3D web technology.
- Liu, Q., Sourin, A. (2006) *Function-defined shape metamorphoses in visual cyberworlds*. *The Visual Computer* 22(12): pp. 977-990(14)
- Lopez, F. (1996) *Cagean Philosophy: a devious version of the classical procedural paradigm*. Volume, DOI:
- Lopez, F. (1997) *Schizophonia vs. l'objet sonore: soundscapes and artistic freedom*. Retrieved April 16th, 2006.
- Lott, J. and R. Reinhardt (2006) *Flash 8 ActionScript Bible*. Indianapolis, Wiley.
- Macromedia Director. <http://www.adobe.com/products/director/>.
- Manovich, L. (1999) *Navigable Space*.
- Manovich, L. (2001) *The Language of New Media*. Cambridge, Mass: MIT Press.
- Maximin, G. (2004) *Avant-garde et art sonore chinois : FM3*, Li Chin Sung, Aitar et 718.
- Max/Msp. <http://www.cycling74.com/products/maxmsp.html>.
- Mazzoleni, P. *CiVeDi: A Customized Virtual Environment for Database Interaction*.
- McLuhan, M. (1962) *The Gutenberg Galaxy: The Making of Typographic Man*. Toronto, University of Toronto Press.
- McLuhan, M. (1964) *Understanding Media: The Extensions of Man*. New York, McGraw Hill.
- McNay, L. (1994) *Foucault: A Critical Introduction*. Cambridge, Polity Press.
- MESO. (1998) *VVVV*. from <http://vwww.org>.
- Miller, P. D. (2002) *Music and Technology: A Roundtable Discussion*.
- Mills, S. (2003) *Michel Foucault*. London, Routledge.
- MIT. (2003) *Simile Timeline*. from <http://www.simile-widgets.org/timeline/>.
- Mnif, K. (2003) *Using XML/HTTP to Store, Serve and Annotate Tactical Scenarios for X3D Operational Visualization and Anti-Terrorist Training*, Navel PostGraduate School Monterey.
- MoCA, M. (1998) *Sound Art at MASS MoCA*. In *Your Ear: Hearing Art in the 21st Century*, North Adams.
- Morie, J. (2003) *The Gestalt of Virtual Environments*. 2003 Presence Conference. Aalborg, Denmark.
- Morie, J., Williams, J., Dozois, A., Luigi, D. (2005) *The Fidelity of "Feel": Emotional Affordance in Virtual Environments*. 11th International Conference on Human-Computer Interaction. Las Vegas, NV; July 2005.
- Nash, A. (2007) *Interview*. *Networked Music Review* Volume, DOI:
- Nechvatal, J. (1999) *Immersive Ideals / Critical Distances: A study of the Affinity between Artistic Ideologies Based in Virtual Reality and Previous Immersive Idioms*. Centre for Advanced Inquiry in the Interactive Arts (CAiiA) Newport, Wales, University of Wales College.
- Nechvatal, J. (2009) *Towards an Immersive Intelligence*. New York - Paris - Turin, Edgewise.
- Neushul, J. D. (2003) *Interoperability, Data Control and Battlespace Visualization Using XML, XSLT and X3D*.
- Norman, K. (2004) *Sounding Art*, Ashgate.
- Ogborn, D. P.-. (1987) *Canadian Electroacoustic Community*.
- Ong, W. J. (1982) *Orality and Literacy: The Technologizing of the Word*. London and New York, New Accents.
- Open source. (2008) *Netbeans*. from <http://www.netbeans.org/>.
- Parisi, T. (2008) *FluxStudio/VivatyStudio*.
- Penwarden, C. (2002) *New York, New sound, New spaces*. *Artpress* 280.
- Pesch, M. (2002) *Transfer and transformation: strategies in the oeuvre of Carsten Nicolai*. *Parachute (Canada)* July-Sept. (no. 107): pp. 80-93, (7 colour)
- Polys, N. F. (2003) *Stylesheet Transformations for Interactive Visualization: Towards a Web3D Chemistry Curricula*.
- Polys, N. F. (2004) *Information-Rich Virtual Environments: Challenges and Outlook*. NASA Virtual Iron Bird Workshop.
- Processing. <http://www.processing.org/>.
- Pure Data (PD) <http://puredata.info/>.
- Rabinow, P. (1984) *The Foucault Reader*. London, Penguin.
- Ranft, R. (2000) *British Library Sound Archive*. from <http://www.bl.uk/nsa>.
- Reinhardt, R. and S. Dowd (2002) *Flash MX Bible*. Indianapolis, Wiley.
- Reitzenstein, R. (1991) *Sound by Artists (review)* MusicWorks.
- Ridley, M. (2004) *Towards an Exploration and Understanding of Post Literacy*, University of Guelph.

- Rose, G. (2006) *Visual Methodologies* (Second Edition), Sage Publications Ltd; edition (28 Dec 2006): 172.
- Rose, N. (1984) *The Formation of the Psychology of the Individual in England 1870-1939*. London, University of London. **Unpublished PhD thesis**.
- Russolo, L. (1916) *L'arte dei Rumori* (The Art of Noise), Edizioni Futuriste di Poesia.
- Ryan, M.-L. (2001) *Narrative as Virtual Reality*. Baltimore and London, John Hopkins Press.
- Satre, J.-P. (1960) *Critique of Dialectical Reason*, Gallimard.
- Schaeffer, J. (1994) *6 Elements of Installation*. **B.A.**
- Scheurich, J. J. (2002) *Policy archaeology: A new policy studies methodology*. *Sociology of Education: Major Themes, Vol. 1: Theories and Methods*. S. B. (Ed.), Routledge.
- Schulz, B. (1998) *Terry Fox: Works with Sound*. Heidelberg, Germany, Kehrer Verlag, .
- Sekula, A. (1989) *The Body & The Archive. The Contest of Meaning: Critical Histories of Photography*. R. Bolton. London, MIT: pp 342-388.
- Sextus Empiricus (1994) *Outlines of Scepticism*. Cambridge, Cambridge University Press.
- Shortess, G. K. (1987) Interactive sound installations using microcomputers. *Leonardo* 20(2): p. 149-53.
- Smalley, D. (2006) Space-Form and the acousmatic image. *Organised Sound* 12((1)): 35-58.
- Smith, J. (2005) X3D as a Useable, Powerful and Web-based Medium for the Creation of a 3D Virtual Tour. *Proceedings of the Mid-States Conference on UnderGraduate Research in Computer Science and Mathematics*.
- Smith, O. F. (1998) *Pre-Fluxus Conceptual Developments and Generative Influences. Fluxus: The History Of An Attitude*.
- Sommaruga, L., Catenazzi, N; (2007) *Curriculum visualization in 3D*. Web3D 2007, Perugia, Italy.
- Sonic_Arts_Network. (2007) *Expo Plymouth*. Retrieved 9th May 2009, from <http://www.sonicartsnetwork.org/expo/>.
- Sourin, A. (2006) *Hybrid Function-based Shape Modelling and Web Visualization*.
- Stanza. (1998) *Soundtoys.net*. from <http://www.soundtoys.net/>.
- Sterne, J. (2003) *The Audible Past: Cultural Origins of Sound Reproduction*. Durham, Duke University Press.
- Stockhausen, K. (1985) *Electronic Music for Kathinka's Chant as Lucifer's Requiem. Perspectives on New Music*.
- Svanaes, D. (2000) *Understanding Interactivity: Steps to a Phenomenology of Human-Computer Interaction*. Retrieved 7th February 2007, 2007, from <http://dag.idi.ntnu.no/interactivity.pdf>.
- Taylor, J. M. (2007a) *Immersion: An Immersive Digital Application for Creative Interaction with Sound Art Archives*. ICMC07, Copenhagen, Re:New.
- Taylor, J. M. (2007b) *The ImmApp: A Digital Application for Immersive Interaction with Sound Art Archives Heidelberg*, Springer Verlag.
- Taylor, J. M. (2008a) *An Immersive Database of Sound Art: Towards a Minor History*. *Atlas of Culture Space*. Daejeon, KAIST.
- Thompson, B. (2005) *SoundasArt - What is Sound Art? SoundasArt Discussion List*.
- Thompson, B. (2008) *Artist Website*. from <http://billthompson.org/>.
- Tonkiss, F. (1998) *Analysing Discourse. Researching Society & Culture*. C. Searle. London, Sage: pp 245-260.
- Toop, D. (1996) *Ocean of Sound: Aether Talk, Ambient Sound and Imaginary Worlds, Serpent's Tail*.
- Toop, D. (2004) *Haunted Weather, Serpent's Tail*.
- Townsend Obadike, K. (2001) *What's in a name? Seeing Sound Art in Black Visual Traditions*. *Art Journal* 60(no4 4-5)
- uncredited (2006) *Joe Colley Artist's Bio*.
- uncredited. (2008) *Road plays Lone Ranger theme*. Retrieved 22 September 2008, from <http://news.bbc.co.uk/1/hi/world/americas/7628668.stm>.
- W3C. (2004) *OWL Web Ontology Language Guide*. Retrieved 2.10.2007, 2007, from <http://w3.org/TR/owl-guide>.
- Wahjudi, C. (2006) *Von Klangkunst und Klang in der Kunst*. *Kunstforum International*(182): p. 422-6.
- Waters, S., M. Rogalsky, et al. (2002) *Sonic Arts Research Archive*. from www.sara.uea.ac.uk/.
- Weber, J. C., Parisi, T. (2007) *An open protocol for wide-area multi-user X3D*. *Proceedings of the twelfth international conference on 3D web technology*, ACM Press.
- Weiss, A. S. (1996) *Radio Icons, Short Circuits, Deep Schisms* TDR (1988-) Vol. 40, (No. 3): pp. 9-15.
- Weiss, A. S., Ed. (2001) *Experimental Sound and Radio*. New York, MIT Press.
- Willis, S. *From XML PDB Data to X3D Ribbon Models*.
- Wilson, L. K. (2005) *A Record of Fear*, English Heritage.
- Wollscheid, A. (2001) *Selected Works*. Frankfurt a.M., Selektion.