

**Composing in the Internet  
Age of Post-Auratic Art**

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## Abstract

This thesis argues the emergence of problematic issues arising from the dematerialisation of studio music technology and its compositional output, compounded by increasingly technically homogenised means of production and distribution. The thesis contends that optimistic claims of democratisation and emancipation surrounding computer music, in addition to proclamations extolling the virtues of the decentralised, distributive opportunities of the web, obscure the effects of such technologies, inviting critical inquiry. An understanding of the origins of techno-romanticism, and the technical processes that inform such utopian viewpoints, are therefore essential in addressing these issues.

Using Jacques Attali's *Noise*, with his Adorno-influenced 'Repeating' and utopian 'Composing' chapters in particular as a starting point, this thesis illustrates how the critical stances of Adorno and Benjamin are reflected in Attali's chapters, and how their respective ideas translate to the imbalances between modes of production and reception present in our fragmented cultural music economy. The thesis argues that the emancipatory affordances that arise within the quotidian use of music, resulting from an unprecedented access to portable music, are at odds with the increased technical demands placed upon musicians within such a system.

Additionally, via Heidegger's modes of revealing and the work of McLuhan, this thesis attempts to articulate the polarising, quasi-deterministic effects of hardware and software technology involved in music production, plus the myriad activities pertaining to its distribution and promotion, as indicative of the subsuming nature of a technological monolith. The existence of contemporary techno-romanticism, resulting from such technical modes of revealing, is posited as driving the mythological dialectics at the core of technological progress, with Platonic dualism at its foundation.

Conclusively, I proposed several practical means of addressing the concerns raised by my research, by rematerialising my own practice and music, including the creation of auratic artefacts, site-specific works, and physical mechanical instruments.

## Acknowledgements

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I am hugely indebted to Nathaniel Reeves for his tirelessly professional design expertise and generous assistance in helping me realise my *Auratic Artefacts*.

I would also like to thank Frank Merritt at The Carvery, for patiently assisting Nathaniel and myself, cutting my music onto the *Auratic Artefacts*.

Finally, I wish to thank the Arduino community for helping me develop the necessary programming code to breathe life into my 'Poietic Plug-in'.



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## List of Included Media

Supporting media has been affixed to the inside rear cover of this thesis. These three discs comprise the following:

### 1. *Like Dust of The Balance* CD album:

CD tracks:

- |              |                   |
|--------------|-------------------|
| 1. Circadies | 6. Hang Garden    |
| 2. Whispers  | 7. Pteron         |
| 3. Dustlands | 8. Lunar Suburbia |
| 4. Raido     | 9. A Great Wave   |
| 5. Napolese  | 10. The Balance   |

2. Audio CDR containing ‘Threnodie’ from my *Death of an Aura EP* (the only track from the EP not also present on ‘Like Dust’), the site-specific installation work, ‘Reception’, the three tracks featured on the *Auratic Artefacts* (‘Alpha/Awaiting the Green Morning’, ‘Beta/David Elsewhere’, ‘Gamma/Jack In’), plus ‘Leaving Arcadia’ (featuring the ‘Poietic Plug-in Glockenspiel’).

CDR tracks:

- |   |   |
|---|---|
| 1. Threnodie                            | 6. Leaving Arcadia (featuring the <i>Poietic Plug-in Glockenspiel</i> ) |
| 2. Reception (stereo version)           | 7. Example of <i>Poietic Plug-in Glockenspiel</i> (clean)               |
| 3. Awaiting the Green Morning (‘Alpha’) | 8. Example of <i>Poietic Plug-in Glockenspiel</i> (prepared with coins) |
| 4. David Elsewhere (‘Beta’)             |   |
| 5. Jack In (‘Gamma’)                    |   |

3. DVD video documenting the manufacturing process of the *Auratic Artefacts* (filmed and edited by Nathaniel Reeves), with additional video documenting the use of my *Poietic Plug-in Glockenspiel* (filmed and edited by myself).

DVD titles:

1. Video documenting the design and manufacture of the *Auratic Artefacts* (filmed and edited by Nathaniel Reeves).
2. Video documenting the *Poietic Plug-in Glockenspiel* in operation (an excerpt from ‘Leaving Arcadia’).

## Introduction

Over the past two decades, we have witnessed unprecedented growth in the power of the internet as a common global forum for the sharing of information. Ideas, images, video and music have all been mobilised to an extent unthinkable prior to the advent of Tim Berners-Lee's 'World Wide Web' in 1990. As a studio musician, growing up and developing my creative practice alongside the growth of the web, I have been fortunate in my ability to utilise these technologies to distribute my music. Advances in computer processing speeds, affordable music technology, and the development of music software, have also greatly increased the possibilities of creating music to a 'professional' standard.<sup>1</sup> More so today than ever before, one can freely download music software and the associated tools necessary to create music on a home computer, at minimal cost, before uploading the resulting music, to be shared globally over the web. Indeed, I owe my moderate success as a musician to these 'democratising' modern technologies, allowing me to disseminate my music without the use of a traditional record label (though I have, to date, released three albums through commercial, independent record labels). This ability to distribute my music online has additionally led to live performance opportunities around the world.<sup>2</sup>

So, then, the development of the internet, plus the ever-increasing power of affordable home computers, are often championed as democratising forces of immense empowerment; within the music industry, these technologies are frequently cited as finally providing the means for musicians to create and disseminate their work without the mediation of record labels, distribution companies and other middlemen.

Yet over the past ten years or so that I have been writing music to be shared or sold in a variety of guises, I have become increasingly conscious of a vague sense of dissatisfaction with my practice. Spending many hours per day on my computer, performing myriad music-related activities as well as non-musical tasks, I have come to question just how much of my practice is actually me, and how much is my computer software. Aware that my music and studio effectively ceases to exist once I shut down my computer, I have felt compelled to raise the question: If modern computer technology, coupled with the distributive potential of the internet, is so empowering and emancipatory, then why do I feel such an entrenched dependence on it? If music technology provides a near-infinite number of compositional

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<sup>1</sup> The use of 'professional' as a metric of production quality is a core irony engendered by the internet's capacity

<sup>2</sup> This, as a computer musician, presents a series of performative issues in itself.

possibilities, then why do I feel my practice is becoming increasingly homogenised? Might the technologies be, in part, responsible for this? The question of technological determinism remains highly pertinent to my practice, and will be addressed towards the second half of this thesis.

First, I will discuss the implications of dematerialised music as it pertains to the utopianism present in Jacques Attali's *Noise* (with his 'Repeating' and 'Composing' chapters bearing particular scrutiny), in an attempt to articulate my growing concern with my techno-centric practice. Using the work of T. W. Adorno and Walter Benjamin (both clear influences on Attali), with specific regard to technology and its supposed emancipatory potential, I will examine how music as artefact is affected and disrupted by its informational transition and subsumption (with particular focus on its auratic character). Following this, I will investigate how the perspectives of production and reception are affected by the technologies surrounding dematerialisation, before assessing notable online mechanisms and strategies currently in place to assist us in navigating the online music economy.

In the second half of my thesis, I shall turn towards a critical investigation of the role played by technology within my practice, assisted by the work of Marshall McLuhan and Martin Heidegger, examining the issue of technological determinism and the ensuing implications of technical interdependence. On uncovering the prismatic modes of engagement that comprise my composing, I will unpick the mythology at the root of modern thought that gives rise to technical biases, and discuss how this affects my creative process.

Alongside my research, I shall document the journey I have taken towards restoring meaning in my practice, beginning with a dematerialised EP download release, and progressing towards collaborative album work. Identifying the key practical issues raised in the process, I will illustrate how I have implemented various measures that address these issues, serving to revive and reclaim bodily agency in my practice. Armed with a fuller understanding of the modes of engagement that encompass both production and reception, I will put in motion my practical plans for auratic restoration, including site-specific works that extend an exploration of bodily agency with the use of the human voice, as well as the creation of a series of 'auratic' musical artefacts, emphasising uniqueness and physical permanence. Tying together several of these threads, I will conclude my practical exploration with the creation of a handcrafted mechanical musical instrument, bridging the divide between the dematerialised software realm and the physical, material world.

Finally, I will explain our propensity for romantic proclamations in the name of technology, despite the effects of its use, charting some of the ideologies that have informed

modern thought, from Plato, through Descartes, noting how these ideologies are connected with our current engagement with computer music technology and software. I will critique the viewpoints of techno-romanticism in as much detail as is practical within this thesis, insofar as these ideas have informed the development of my creative response to the contemporary technological and cultural conditions under which I work.



## Chapter 1. The Dawn of Dematerialisation

In this chapter I will outline Jacques Attali's influential book, *Noise: The Political Economy of Music*, focusing specifically on the 'Repeating' and 'Composing' chapters.<sup>3</sup> I will compare the relevant inferences of these chapters with my own experiences as a computer musician, and discuss the implications of music's dematerialisation from both the perspectives of musician and listener. I shall discuss T.W. Adorno's clear influences on Attali, as well as explore Adorno and Walter Benjamin's critical stances towards the use of technology in accessing and distributing art, and how their ideas translate to our present online music economy.

As a composer working largely within the domain of the computer, I will also attempt to articulate my concerns with dematerialised music as artefact, regarding the complications that arise during the transition from economic exchange-value to pure use-value. Accordingly, I will identify the practicalities and difficulties of working within the immaterial software realm, proposing a need to *rematerialise* my musical practice.

Additionally, I will explain how the pessimistic portrayal of Repeating is at odds with the current cultural function and use of dematerialised music, and propose a more positive, liberating interpretation of Repeating. I will discuss the emergence of a 'ubiquitous' mode of listening, resulting from increasingly portable and accessible music, leading to a 're-ritualising' of music through its quotidian use, evidencing an active agency on the part of the listener, contradicting Adorno and Attali's negative and monolithic view of Repeating.

Finally, I shall illustrate that whether one subscribes to the view that we remain in a state of Repeating, or indeed have entered an age of Composing, depends on the subscription to a modal perspective of either production or reception. Consequently, the splitting of Repeating into its component modes of production and reception illustrates an imbalance; for listeners, Repeating is hugely liberating and rewarding, and thus appears to signal the dawn of Composing, yet for musicians, the case remains, at best, unclear.

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<sup>3</sup> To avoid confusion, I shall refer to Attali's chapters and the appropriate activities therein, with capital letters. Thus 'Composition', 'Composing' and 'Composer' all refer specifically to the 'Composing' chapter, while 'composer' and 'composition' can be read with their usual meanings. Similarly, 'Repeating' and 'Repetition' are both specific references to the 'Repeating' chapter.

## 1.1 Noise: Violence and Order

Before we examine the present culture of renewed technoromantic utopianism and its origins, I will quickly recap Attali's points within *Noise* that have set the stage for this utopian optimism within *Composing*.

One of Attali's central tenets within *Noise*, as outlaid within his introductory 'Listening' chapter, is that of music as a harbinger of social change. Attali proposes that the basic character of music throughout history has foreshadowed subsequent cultural, political and economic revolutions, and suggests that changes in music today predict future changes in society. Two pages into the first chapter, Attali boldly suggests, "if it is true that the political organisation of the twentieth century is rooted in the political thought of the nineteenth, the latter is almost entirely present in embryonic form in the music of the eighteenth century."<sup>4</sup> When we combine this portentous view of music with *Composing*, we bear witness to a romantic 'epochism' typical of the kind of rhetoric employed by technologists and techno-evangelists. We are always 'almost there', constantly on the cusp of a great revolution that will apparently usher in an era of unprecedented opportunity for musicians operating in the online age.<sup>5</sup>

Within *Noise*, Attali historicises music into four distinct phases, with a chapter dedicated to each, tracing the political economy of music by constructing a map of influential points of interference and dependency between music and society, rather than the usual

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<sup>4</sup> Jacques Attali, *Noise: The Political Economy of Music* (Minneapolis, London: University of Minnesota Press, 1985), p. 4.

<sup>5</sup> Self-styled 'media futurist' Gerd Leonhard springs to mind ([www.mediafuturist.com](http://www.mediafuturist.com)), offering predictions on the future of music, as well as providing a didactic approach to realising them. An interesting symptom of advice from such technology 'gurus' as Leonhard is the curious conflation of music production (and media production in general) with the language of business and corporate economic planning. As musicians, fending for ourselves online, we are now instructed on how to maximise our 'brand's' marketing effectiveness and earning potential. This overt corporatising of our artistic pursuits, while arguably necessary to be heard amidst the online glut of artists and music, seems at odds with *Composing*.

Kevin Kelly's popular and enticing '1000 True Fans' theory from 2008, discussed in the following chapter, is a powerful attempt to convince musicians of the possibility of earning a living writing and performing music in today's niche markets, via online connectivity. While not quite as hot a topic these days, the theory is still being continually refined, refuted and defended, as musicians and technologists repeatedly attempt to devise a formula for financial success.

In 2009, Techdirt founder Mike Masnick took up the challenge quite literally, boiling-down a set of principles to create his 'CwF + RtB' formula (i.e. 'Connect with Fans + Reason to Buy'). A concession to the nature of dematerialised music (or any other unlimited goods) and the difficulty selling it, Masnick suggested artists take a boutique approach to selling music and merchandise, selling higher-priced limited edition works that would appeal to Kelly's 'True Fans' ([www.techdirt.com](http://www.techdirt.com)).

Articles also worth noting are 'Danger Mouse's Grey Album, Mash-Ups, and the Age of Composition' by Philip A. Gunderson (*Postmodern Culture*, Volume 15, No. 1, September 2004), and 'MP3s Are Killing Home Taping: The Rise of Internet Distribution and Its Challenge to the Major Label Music Monopoly' by Kembrew McLeod (*Popular Music and Society*, vol. 28, no. 4, October 2005).

diachronic or stylistic categorising of music history. These successive phases are ‘Sacrificing’, ‘Representing’, plus the aforementioned ‘Repeating’, and ‘Composing’ phases. These sequential phases do not completely supplant one another, but add to the previous phase, according to Attali, resulting in a greater complexity of the role of music in society, alongside the gradual removal of its ritual value. Throughout this thesis, I will be concentrating primarily on the last two phases, as they are without a doubt the most pertinent of Attali’s ideas given the fertile yet tumultuous online culture in which I find myself as a modern composer. Both chapters beg for a critical assessment of the problematic implications they raise, and invite a discussion concerning the ideas at their foundations.

Before I examine these final two chapters in detail, I wish to present a brief summary of the initial chapters leading up to them, as although Attali is keen to stress that each phase does not supplant the previous, they do nevertheless follow a distinctly progressive trajectory.

The first of these four phases is ‘Sacrificing’, which Attali explains in the anthropological sense, suggesting the theory of René Girard, in that sacrifice served the earliest human society in order to channel and replace violence in society that would otherwise destroy order. Attali writes, “The majority of ancient societies lived in terror of identity; this fear created a desire to imitate, it created rivalry, and thus an uncontrolled violence that spread like a plague.”<sup>6</sup> In an attempt to control this threat, society created designated scapegoats, a ritual sacrifice or simulacrum of violence, to control and inhibit social chaos, or violence. Society thus created a set of stable social hierarchies, with organised religion being one notable example of this.

According to Attali, the earliest essential role of music was to perform this exact function: to serve as a simulacrum of sacrifice. Attali initially equates noise with violence: “To make noise is to interrupt a transmission, to disconnect, to kill. It is a simulacrum of murder.”<sup>7</sup> Noise, like violence, is silencing. Music, then, becomes a channelling of noise, a way of controlling and subduing the chaos of noise by creating a harmonious order in the realm of sound. Attali sees within this the ability to bolster and strengthen social order, despite the continued threat and presence of ‘noise’ or dissent at the periphery of society.

Attali makes several historical references to illustrate the importance of music as an important tool of the governing class of society, as well as their opponents. Quoting the Chinese historian Ssu-ma Ch’ien, Attali writes, “The sacrifices and music, the rites and the

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<sup>6</sup> Attali, *Noise*, p. 26.

<sup>7</sup> *Ibid.*

laws have a single aim; it is through them that the hearts of the people are united, and it is through them that the method of good government arises.”<sup>8</sup>

Attali stresses that, at any point in time in society, a struggle takes place between the ‘official’ music, symbolising order and stability, and able to channel violence into harmony, and a subversive music, expressing anger and disquiet from the powerless sectors of society. With these points in mind, Attali’s notion of music as premonitory is tenable, as it makes sense that society will project an ideal vision through its arts before that vision can become fully realised.

During this sacrificial phase, Attali feels that the function of music essentially remained unchanged, until the rise of capitalism in the late medieval and early renaissance periods in Europe. Attali notes a shift in the use of music, with roaming jongleurs becoming court-employed minstrels, as feudalistic society transforms into early capitalism. This transition marks the introduction of Representing. No longer is music in society performed solely by improvising jongleurs, but also written specifically for entertaining royalty and nobles alike. This in turn progresses to the entertainment filtering down to the middle classes, with tickets sold for predefined performances, such as opera and theatre. For the first time, music is created specifically for financial gain through mass public consumption. It is a small step, from the primitive capitalism of commodified performances within Representing, to the technologically driven reification of performances as mass-produced musical objects within Repeating.

Attali’s penultimate phase, Repeating, stems from the early twentieth century dawn of recording technologies, mass-production and mass-consumption of music in the home: the commoditisation of music and the birth of the recording industry. As such, this phase of Repetition is typified by large conglomerates, which control the music styles we hear, how we hear it, and since the advent of radio and music television, when we hear it. As before, this phase joins the previous two phases of music, further complicating the role of music in society. It is with this phase that Attali brought his theories up to his present day when published in 1976, and we remain, overall, within the throes of this phase today. However, for Attali, the technological advancements that established the dominance of Repetition and the recording industry up to the present also nourished the embryonic fourth stage, Composing.

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<sup>8</sup> Attali, *Noise*, p. 29.

Assuming suitable conditions were established, Composition would hypothetically emancipate us from the cycle of Repetition, heralding the arrival of new social relations.<sup>9</sup>

## 1.2 Composing: A Positive Refinement of Repetition?

In July 2001, *The Wire* magazine carried a transcription of a speech made by Jacques Attali during the *Cybersalon Net.Music* conference from May that year. Attali suggested that his utopian ‘Composing’ chapter was being partly realised due to the creative and distributive autonomy afforded by the internet. In Timothy Taylor’s popular *Strange Sounds* book on music technology and culture, published that same year, Taylor draws a similar conclusion regarding DIY electronica artists, suggesting that the availability of affordable equipment, coupled with the dissemination of online information, would “indicate that Attali’s moment of composition is here, at least, on the fringes. Perhaps the day will come when our shiny new Packard Bell personal computer will be seen not just as a fancy type-writer or internet connection, but as a machine that allows people to make their own music instead of buying it.”<sup>10</sup>

Since 1999, I have been producing music as one of a generation of computer musicians who have grown up alongside the rise of the personal computer. Taylor’s portentous appraisal, informed by his case studies of two electronic musicians reflecting my own experience, would certainly seem vindicated. Concerning his last point regarding the replacement of purchased music with our own creations, this too appears evident judging by the number of artists vying for online attention; album sales have suffered a consistent decline since the turn of the new millennium,<sup>11</sup> although clearly, factors such as alternative rival means of entertainment will also come in to play.

It appears that *Noise* resonates saliently with a renewed relevance among the music community, and with the emergence of a thriving online information economy, it resonates

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<sup>9</sup> Attali, *Noise*, p. 20.

<sup>10</sup> Taylor, Timothy D., *Strange Sounds: Music, Technology and Culture* (New York, London: Routledge, 2001), p. 164.

<sup>11</sup> Figures published by Nielsen Soundscan illustrated a drop in combined CD and downloads sales in the US of 54.1%, as reported by the Digital Music News website, <[www.digitalmusicnews.com/stories/012709album](http://www.digitalmusicnews.com/stories/012709album)> (Accessed 16th September 2010). National Public Radio (NPR) reported sales figures published by Billboard that mirror the findings of Nielsen Soundscan, displaying falling overall sales throughout the decade, despite a rising proportion of download sales, <[www.npr.org/blogs/money/2010/08/25/129428450/album-sales-hit-record-lows](http://www.npr.org/blogs/money/2010/08/25/129428450/album-sales-hit-record-lows)> (Accessed 16th September 2010). The Guardian reports a similar fall in sales between 2003 and 2009 in the UK, followed by a 1.4% rise in sales figures towards the end of 2009, <[www.guardian.co.uk/music/2010/apr/26/uk-recorded-music-sales-rise](http://www.guardian.co.uk/music/2010/apr/26/uk-recorded-music-sales-rise)> (Accessed 16th September 2010).

more strongly than ever before. Indeed, *Noise* was a celebrated work upon its release in 1977 (followed by the release of its translated edition in 1985, from which I reference), tapping into the emerging DIY mindset and punk aesthetics that were rising throughout the late seventies.

During the *Cybersalon* conference, Attali was keen to update his seventies utopianism with a contemporary relevance, tempering it with a smattering of possible contingencies, suggesting three viable routes that may shape the musical economy in the immediate future. Which of Attali's chapters best describe the logical terminus of current musical practice: the dystopian corporatisation of Repeating or the emancipatory and utopian Composing?

Two of these options propose the sustained domination of Repeating, i.e. the continued mass-reproduction and commoditisation of music, though each for quite different ends. One option would closely resemble the enforced mode of production typified by the music industry as it has been for the past eighty years: a powerful conglomerative control by the few (now the big four music industries) over the many. The second of these routes would see artists individually take control of a similar mode of production, with each artist controlling the decentralised sale and distribution of their music in an open-ended but somewhat splintered interpretation of Repeating. For example, each artist would sell music from their own website, sell their own CDs at gigs etc., with no core third-party organisation controlling or profiting from these individuated operations. Effectively, these two scenarios would see music, whether as mp3 or CD, vinyl etc., treated as a single finite commodity, governed by the traditional economics of scarcity and demand. Given the dizzying abundance of music available for purchase today, the production of demand constitutes the most important aspect of music commoditisation.

However, following the dematerialisation<sup>13</sup> of the music format and the evolution of peer-to-peer file sharing, music torrent sites and music blogs,<sup>14</sup> it is clear that music cannot be governed by traditional laws of economics, unless an artificial scarcity can be imposed on dematerialised music in the form of DRM (i.e. digital rights management, restricting how and when we listen to our music). There are many facets to this issue, some of which I shall explore later in this chapter, but it must be clear to musicians operating in this current

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<sup>13</sup> I use the term 'dematerialised' in reference to Philip Auslander, 'Looking at Records', *The Drama Review*, Vol. 45, No. 1 (Spring, 2001), pp. 77-83. Although it can be said that the music exists through each medium in a particular instance (i.e. on the internet, on my computer's hard disk, on my iPod, phone etc.), its tenuous reliance on any particular medium or context is diminished to the point of near-meaninglessness.

<sup>14</sup> Specifically, illegal music blogs created for the sole purpose of providing music downloads (usually via one of the many separate anonymous sharing/hosting websites such as Rapidshare and Megaupload. BitTorrent is a decentralised file distribution protocol that has been adopted, for the most part, for illegal file distribution, embraced due to its increased user anonymity (as it does not rely on a central node to co-ordinate users).

economic climate that these two related scenarios most closely describe our current situation. The music industry is still attempting to sell music downloads as a commodity, whether through iTunes, eMusic et al., or through artists' own individual websites.

Attali's third suggestion, however, is a more intriguing extension of his musings from his Composing chapter. Here he proposes a "potlatch scenario, where people will exchange music just for the pleasure of actually giving".<sup>15</sup> It is, in short, a 'gift economy', as prominently posited by Marcel Mauss in *The Gift* (1990), and while beyond the remit of this thesis, certainly merits further investigation, especially as such scenarios appear to neatly side-step the economic issues plaguing commercial dematerialised music (as well as introducing the problem of how musicians can be remunerated for their work). With the advent of the Creative Commons, we are seeing more artists work and re-work each other's material free from the constraints of copyright law.<sup>16</sup> Indeed, the Creative Commons enjoys ardent followers, many of whom strongly believe that the future of music is with such a system.<sup>17</sup>

Lewis Sykes, head of Cybersalon and self-styled technologist, supports Attali's prophesising, using the Hip Hop genre, as well as artists such as the sample-heavy producers Coldcut, as precursors of a forthcoming age of Composition.<sup>18</sup> Sykes notes Susan McClary's remarks in her Afterword to *Noise*, identifying a Composer as someone who can create music free from the institutional training of our academies and universities, with the tools to do so, and with the unconstrained social networks in place through which music dissemination, decentralised collaboration, and interaction can all take place. But, as Sykes also points out, Hip Hop thrived on the very existence of a Repetitive economy: "The exponents of Hip Hop elevated the deck and mixer, the mechanism for playing the simulacrum of exchange in the Repetition economy, to the level of an instrument ... The irony of subverting both the sign and the machinery of Repetition is obvious."<sup>19</sup> This example, a genre that relies on Repetition in order to exist, illustrates the uneasy transition between Repeating and Composing. Repeating is a foundation to Composing, existing while technology and practice mature until a critical

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<sup>15</sup> Jacques Attali in *The Wire* magazine, July 2001.

<sup>16</sup> Creative Commons is a non-profit organisation, created to assist and improve sharing and collaboration. ([www.creativecommons.org.uk](http://www.creativecommons.org.uk)).

<sup>17</sup> CC Co-founder, Lawrence Lessig, is a staunch advocate for a reduction in copyright restrictions (particularly with regard to online material), and promotes free/open source software.

<sup>18</sup> Lewis Sykes, *What is all the Noise About?* <[www.soundtoys.net/journals/the-history-of-convergence](http://www.soundtoys.net/journals/the-history-of-convergence)> (Accessed 16th September 2010).

<sup>19</sup> *Ibid.*

mass ‘crisis of proliferation’ is reached.<sup>20</sup> However, I do take issue with Sykes’ notion of the elevation of the deck and mixer to the level of an instrument as subversive, and would argue that this is no more a subversion of Repeating than the electric guitar has been; these are merely small cogs in the larger machine, serving to power the cyclical momentum to Repeating.<sup>21</sup>

As we find ourselves firmly within the throes of the internet economy, witnessing promises fulfilled that were initially made during the dot-com boom and bust of the late nineties and turn of the new millennium, Attali’s utopianism is now also supported by a chorus of technologists, self-proclaimed ‘social media experts’ and techno-gurus. All of whom promise to help us realise the ostensibly unlimited potential of a decentralised, so-called ‘democratised’, online economy.

### **1.3 Death in Repetition: The Dematerialised Commodity**

Attali’s Adornian ‘Repeating’ phase (echoing sentiments of Adorno’s ‘Mass Culture’ essays),<sup>24</sup> stems from the early twentieth century dawn of recording technologies, mass-production and mass-consumption of music in the home, the commoditisation of music and the birth of the record industry.<sup>25</sup> As a model commodity, this era of popular music is prone to rapid but superficial stylistic change, in a constant state of flux, necessary to create and facilitate the demand for more music. New styles, genres and sub-genres continually spring up, with musical media formats being invented and reinvented, to ensure a healthy financial turnover from eager consumers.

Attali uses the term ‘Composing’ in direct response to the age of Repetition, which according to Attali can be seen as a rather lifeless era of reconstitution and recycling, rather than of innovation and the composition of new music. Death recurs thematically throughout Repeating, compared to Composing, which is positioned as a rebirth. In contrast to the preceding chapters, which site music within and of the body, Repeating sees the removal of music from the body, which is instead stockpiled within the disembodied recording (and thus

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<sup>20</sup> Attali, *Noise*, p. 130.

<sup>21</sup> Hip Hop is, after all, one of the most lucrative commercial successes within the record industry of the past twenty years.

<sup>24</sup> Attali draws on Adorno throughout *Noise*, employing similar metaphors such as Homer’s *Odyssey*, as also used in Adorno and Horkheimer’s *Dialectic of Enlightenment*.

<sup>25</sup> Although Attali considers the phonograph as signalling the start of Repeating, the commodification of mass-produced sheet music in the nineteenth century would arguably be a more accurate marker. Yet the mass production of the phonograph undoubtedly had a far greater impact on the cultural economy.

‘dead’). In addition to its centrality to Repeating, Attali ties together his motif of death with his notion of music’s portentousness: “For death, more generally, is present in the very structure of the repetitive economy: *the stockpiling of use-time in the commodity object is fundamentally a herald of death.*”<sup>27</sup>

Attali is far from alone in considering music recordings as a metaphor of death. As Jonathan Sterne posits: “If there was a defining figure in early accounts of sound recording, it was the possibility of preserving the voice beyond the death of the speaker.”<sup>28</sup> As a powerful document of speech, recording technologies were advanced by the opportunity to create an audible legacy that would cheat death. Evan Eisenberg also notes various historical allusions towards recorded music as a kind of musical entombing, taking the viewpoint that music was a superior art form until the advent of sound recording, due to the fact that it could not be contained or embodied. In his *Lectures on Aesthetics*, Hegel considered music second only to poetry as the superior art form, due to music’s sensual and romantic nature, whereas poetry could claim superiority as a product of transcendental reason.<sup>29</sup> For Hegel, music’s “temporal ideality” and its “inwardness of matter and inspiration of soul”, places it at the centre of the romantic arts.<sup>30</sup> True art “is never fixed, but always flowing”, wrote Emerson,<sup>31</sup> “if life is flux, fixity is death”.<sup>32</sup> From these perspectives music would seem unsuited as a reified *objet d’art*. This romantic idealisation of the spontaneous and ephemeral is echoed in Composing, although from a decidedly socialist standpoint. Attali posits the free-improvising strain of jazz as the perfect candidate to foreshadow his idealised state of creative autonomy, only to be dismantled by Repeating, the monopolising manufacturing of recordings (and the ‘stockpiling of death’<sup>33</sup>), smothered due to a lack of alternative distribution networks (which of course arguably now exists in the form of the internet, technical caveats notwithstanding).<sup>34</sup>

It is not a huge leap of imagination to view the shedding of music’s physicality within the past couple of decades, since the advent of mp3 encodings, as a kind of musical transcendence, discarding the bounds of material vessels, commodity fetishism, reasserting its superiority and ‘temporal ideality’. But even though this is at first sight a plausible construct,

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<sup>27</sup> Attali, *Noise*, p. 126. Emphasis in original.

<sup>28</sup> Sterne, Jonathan, *The Audible Past: Cultural Origins of Sound Reproduction* (Duke University Press, 2003), p. 287.

<sup>29</sup> Hegel, *Lectures on Aesthetics*, <[www.marxists.org/reference/archive/hegel/works/ae/ch03.htm](http://www.marxists.org/reference/archive/hegel/works/ae/ch03.htm)> (Accessed 16th September 2010).

<sup>30</sup> *Ibid.*

<sup>31</sup> Emerson, cited by Evan Eisenberg, *The Recording Angel*, second edition (Yale University Press, 2005), p. 13.

<sup>32</sup> Eisenberg, *The Recording Angel*, p. 13.

<sup>33</sup> Attali, *Noise*, p. 126.

<sup>34</sup> *Ibid.*, p. 138.

it would be a naïve viewpoint. What we still see is a strong sense of a ‘trading cards’ fetishism, a hoarding of mp3s and musical stockpiling that would put compulsive phonograph collectors such as Eisenberg’s ‘Clarence’ character to shame.<sup>35</sup> What Eisenberg notes as a philistine, competitive consumption of music,<sup>36</sup> or even the compulsive collecting of music commodities, can be re-read through Attali’s ‘use-time stockpiling’, whereby at the very height of ‘Repeating’, so much music can be collected that one’s own finite lifetime itself becomes the limiting factor on the music’s use. If we note, at the time of writing, that the iPod’s storage capacity of around 160 gigabytes means we may store a total of approximately 110 continuous days of music without hearing the same song twice,<sup>37</sup> then we might be forgiven for reaching the conclusion that we have nigh-on arrived at the almost comical limit of Attali’s use-time value.<sup>38</sup> Simultaneously, dematerialised music has zero economic exchange-value, unlike its physical counterparts (CDs, cassette tapes, vinyl records etc. which can be sold on the second-hand markets), and so the act of collecting dematerialised music takes on an irrational, compulsive state, existing in an economic limbo.<sup>39</sup> McLuhan anticipates this, writing in 1964, that “today the action and the reaction occur almost at the same time. We actually live mythically and integrally, as it were, but we continue to think in the old, fragmented space and time patterns of the pre-electric age.”<sup>40</sup> It certainly seems plausible, as noted by Erik Davis, that “once touched with archive fever, the forest grows more important than the trees, and the forest keeps growing.”<sup>41</sup> We only have to look at the proliferation of exclusive membership-only music torrent sites on the internet to see proof of such active and compulsive foraging, in an effort to sustain user ‘share ratios’.<sup>42</sup> It appears that the currency of music for many people, more than ever before despite dematerialisation, lies in its

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<sup>35</sup> Eisenberg, *The Recording Angel*, p. 1. Clarence is depicted as a compulsive collector of records, much to the detriment of every other aspect of his life.

<sup>36</sup> *Ibid*, p. 16.

<sup>37</sup> Assuming 160GB provides enough storage for 40,000 4-minute songs, as claimed by iPod-makers Apple.

<sup>38</sup> Attali, *Noise*, p. 101. ‘Use-value’ is, according to Attali, the value we ascribe to the time spent on a particular activity (or ‘use-time’), in this case listening to music. If the stockpiling of use-time becomes so great that we no longer have the time to listen to all the music to which we have access, and cannot generate exchange-time through labour (earning enough leisure time) then we instead substitute stockpiling for use.

<sup>39</sup> Though this did not stop Bopaboo, a short-lived online company started in 2008, from trying to facilitate the sale of second-hand mp3s.

<sup>40</sup> Marshall McLuhan, *Understanding Media* (New York, London: Routledge, 1964), p. 5.

<sup>41</sup> Erik Davis, ‘Archive Fever’,

[www.techgnosis.com/chunks.php?sec=articles&cat=the+analog+life&file=chunkfrom-2008-07-25-1558-0.txt](http://www.techgnosis.com/chunks.php?sec=articles&cat=the+analog+life&file=chunkfrom-2008-07-25-1558-0.txt) (Accessed 14th September 2010)

<sup>42</sup> Such torrent sites rely on users maintaining favourable download-to-upload ratios. Should you end up downloading more than you upload (i.e. your share ratio drops below 1.00) you risk being banned from the community.

accumulation, thereby becoming “a sign rather than a sound”.<sup>43</sup> As a composer, I must consider the necessary measures I need to take to ensure that my music is exactly the opposite of this, and is, as at the very least, a sound to be experienced, not simply a signal of accumulation. Increasingly, I find dematerialised music to be an unsatisfactory product of my compositional practice, even before I consider its existence amid a crowded online economy.

For Eisenberg, we “can have a sincere love of culture without having any interest in it. That kind of love is almost as well satisfied by owning records as by listening to them.”<sup>44</sup> This nod towards the philistine approach to commodity collection can easily apply to dematerialised music, though as evidenced by the activity on music torrent sites, this collection process need not include actually buying the music. Eisenberg suggests the desire to listen to music is completely separate from the desire to buy, and only occasionally happen to coincide: “The buying is what counts, which is one reason why the record buyer is insatiable. The desire to buy does not always coincide with the desire to hear music. If I want to hear music; surely there is something on my shelf or on the radio that can satisfy me ... [t]he desire to buy, on the other hand, explodes when my wallet reaches a certain critical mass, or when I’m anxious, or when I’ve worked hard at something idiotic and want a reward.”<sup>45</sup> In downloading huge collections of dematerialised music, legally purchased or otherwise, we are compounding our commodity fetishism, adding to our use-time stockpiles without necessarily satisfying our consumerist urges, traditionally sated by physical goods; in one fell-swoop music has become pure use-value.<sup>46</sup>

What then, do we make of this curious transitory stage, during which our commodity-trained habits of consumption play catch-up to the vagaries of dematerialised music? Philip Auslander touches upon this cultural disconnect between the consumer acts of purchasing and listening using Guy Debord’s Situationist ‘anti-ocularcentrism’<sup>47</sup> as a framework within which to work. Debord’s critical notion is of a passive consumer society led chiefly by its *visual* contemplation of the spectacle with an alienated gaze, at the expense of individual

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<sup>43</sup> Davis, ‘Archive Fever’.

<sup>44</sup> Eisenberg, *The Recording Angel*, p. 16.

<sup>45</sup> *Ibid.*, p. 16.

<sup>46</sup> The urge to buy, exchanging cash for commodity, is therefore only partly sated by dematerialised music, which fails to satisfy our consumer needs on a number of levels. We cannot browse our collection knowing it has achieved a certain level of permanence, with a tactile thoroughness, following years of hard-earned foraging and procurement. We cannot know our music as objects; at best dematerialised music exists as pixels on our computer screen until we actually listen to them: they are now pure use-value. We cannot curate and display our collections to others as trophies of our good taste, and as philistine as this may be, it accounts for a large part of consumerism (and is both a factor developed and relied upon by advertising and marketing).

<sup>47</sup> Philip Auslander, ‘Looking at Records’, *The Drama Review* (Vol. 45, No. 1, 2001), p. 81.

agency: “The more he contemplates, the less he lives; the more he identifies with the dominant images of need, the less he understands his own life and his own desires”.<sup>49</sup> Debord defines the spectacle as “*capital* accumulated to the point that it becomes images”,<sup>50</sup> functioning as “the concrete manufacture of alienation”.<sup>51</sup> As Auslander explains: “In Debord’s terms, sound recordings are abstract representations of music, objects that become visual signs for music whose very proliferation subordinates the actual use of music to its status as commodity object.”<sup>52</sup> In creating record sleeves and CD booklets with attractive artwork, enticing visual extras such as posters, and striking exotic packaging to tempt consumers, the actual music contained on the record or disc has been subordinated to its visual physical commoditisation. For a commodity intended for consumption through listening, the apparently passive, contemplative gaze about the music’s physicality can be read as an unwitting challenge to the intended aural spectacle; it is a temporary rejection of the prescribed method of consumption, illustrated most explicitly by collectors like Eisenberg’s ‘Clarence’.<sup>53</sup> For the rest of us, this trans-sensual consumption usually merely primes us for the main event, inducing an excitement and inflating expectation ahead of the music. This friction between the musical commodity as a visual spectacle or artefact, as well as aural, is intoxicating. Whether or not we class the visual facet of audio medium subversive or supportive, I feel it is vitally important to acknowledge this complex multi-sensory engagement; I feel as a producer that dematerialised music strips away all we thought we could do without, only to find what we are left with strangely lacking. Consequently, I will seek to retain this tension between physical commodity and the music it represents or challenges, as part of my practical work in support of this thesis.

Considering dematerialised music in this Situationist light, Debord’s premise ceases to resonate; free from the material commodity fetishism (and free from exchange-value), music no longer exists as physical spectacle, only as ‘pure’ music. Lacking this Situationist friction between multi-sense modes of consumption, plus the loss of exchange-value, music once again appears to transcend this crass reification, returning to a state of apparent ethereality or

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<sup>49</sup> Debord, Guy, *Society of the Spectacle* (Rebel Press), § 30, p. 16. This seems very much akin to Nietzsche’s notion of understanding as arresting action. On Shakespeare’s Hamlet: “The knowledge kills action, for action requires a state of being in which we are covered with the veil of illusion”. Nietzsche, Friedrich, *The Birth of Tragedy* (NuVision Publications, 2007), p. 36.

<sup>50</sup> *Ibid.*, § 34, p. 17.

<sup>51</sup> Debord, *Society of the Spectacle*, § 32, p. 16.

<sup>52</sup> Auslander, ‘Looking at Records’, *The Drama Review*, p. 79.

<sup>53</sup> Who, as discussed earlier, collects music with an occasionally irrational compulsion, e.g. purchasing phonograph records with his name in the title.

purity. Of course, this is not true; though dematerialised music may once again appear to have achieved ethereality, its entrenched dependence upon technology is far stronger than ever before. Not only does it require computer technology for its decoding, such as a fetishised gadget like an iPod, it requires such technology to exist, stored on hard disk platters or memory chips in a barely tangible state of constant fragility.

As Auslander argues: “The trend we are seeing now towards the disappearance of specific physical objects and the consumption of music as pure digital information (as mp3 files and such) constitutes a *hypercommodification* of music in which musical sound becomes a commodity in itself ... [removed] from the realm of spectacular object.”<sup>54</sup> For a society conditioned to value music in accordance with its exchange value as a Debordian spectacle, rather than its use-value, this has troubling implications for recording musicians hoping to earn a living selling dematerialised music. It raises the issue of whether the shift from exchange-value to use-value as the primary currency of music will see a corresponding shift in consumer attitudes, and if so, how long this lag between states will be. Pragmatically, this also explains a return to the ‘boutique’ approach of limited edition vinyl pressings and suchlike, as a concerted effort to retain value via the economics of scarcity and spectacular visual commoditisation.

#### **1.4 Composing vs. Repeating: From Disintermediation to Recentralisation**

According to Attali, Composition can exist outside the monopoly of the musical commodity, breaking the cycle of Repetition. Attali describes Composition as an activity “in which the musician plays primarily for himself, outside any operationality, spectacle, or accumulation of value; when music, extricating itself from the codes of Sacrifice, Representation and Repetition, emerges as an activity that is an end in itself, that creates its own code at the same time as the work.”<sup>55</sup> He continues, defining the role of the Composer as follows:

Composition thus appears as a negation of roles and labour as constructed by the old codes. Therefore, in the final analysis, to listen to music in the network of composition is to rewrite it: ‘to put music into operation, to draw it toward an unknown praxis’, as Roland Barthes writes in a fine text on Beethoven. The listener is the operator. Composition, then, beyond the realm of music, calls into question the distinction between worker and consumer, between doing and destroying, a fundamental division of roles in all societies in which usage is

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<sup>54</sup> Auslander, *Looking at Records, The Drama Review*, p. 82.

<sup>55</sup> Attali, *Noise*, p. 135.

defined by a code; to compose is to take pleasure in the instruments, the tools of communication, in use-time and exchange-time as lived and no longer as stockpiled.<sup>56</sup>

The traditional roles of composer, performer, and even listener, Attali contends, will break down to become different facets of a single Composer. Attali's notion of the listener as composer has important implications for music, especially within the field of electronic music, where music becomes detached from the original composer, to be re-assimilated and remixed, in the age of the DJ and so-called 'bootleg remixes' or 'mashups'. The life of such a piece of music often undergoes many transformations over a relatively short period of time, and as Attali suggests in the above paragraph, a new era exists for music to be exchanged and reworked, transformed, and in effect reincarnated, rather than simply be stockpiled as dead commodity. Never before has the distinction between composers, performers and listeners been so unclear, though it is certainly not difficult to envisage how Attali formulated these ideas amidst the burgeoning punk and anti-establishment DIY movements of the mid-to-late seventies. However, I do feel that the notion of music existing outside a sphere of 'operationality, spectacle or accumulation of value', currently sounds particularly utopian; if the ability to download, rework and exchange each other's dematerialised music via the internet constitutes Composing, then it represents a technologically mediated act of isolation and alienation. Being required to sit in front of the computer in order to process the simulacritic data signs of dematerialised music does not, in my mind, appear emancipatory; if empowering, it is, as I will argue in later chapters of this thesis, an acutely technical polarisation of empowerment. For the listener, however, such a state of technical interconnectedness may indeed prove emancipatory. As I will shortly attempt to illustrate, the apparent synthesis between modes of production and reception that Composing suggests, belies the technically dependent imbalances that will inevitably emerge.

This idea of the listener as composer or compositional partner, like many of Attali's ideas within *Noise*, echoes Adorno, for whom an understanding of Schoenberg's music developed a critical reasoning; as Tia DeNora states: "in and through its tonal breadth, it inculcates a form of advanced cognition, a mode of sense-making that could accommodate more of material—lengthy stretches of tones and attenuated tonal relationships, for example."<sup>57</sup> To understand Schoenberg necessitates an understanding of the nature of musical

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<sup>56</sup> Attali, *Noise*, p. 135.

<sup>57</sup> DeNora, Tia, *After Adorno: Rethinking Music Sociology* (Cambridge University Press, 2003), p. 20.

composition. In effect, Adorno's ideal listener would realise his potential playing the part of Attali's Composer, acting upon his latent musical knowledge: "To interpret language means to understand language; to interpret music means to make music."<sup>58</sup> Adorno appreciated modernist composers such as Schoenberg and Berg precisely due to their refusal to employ what he saw as compositional clichés and conventions, which relied on a comfortable familiarity of prior musical structures encountered by the listener—a musical crutch. For Adorno this reliance on what he saw as 'pre-digested' music would engender a passive mode of listening, rather than the active mode necessary to interpret a piece with no such familiar sonic comforts. Yet, as I will later argue, such a view assumes a direct and uninhibited dialogue between music and listener, and ignores the potential for meaning engendered through the multiple modes of reception, leveraged by portable and ubiquitous music. When we consider how the modes of production are affected by dematerialisation, against the modes of reception, we will discover an ambivalence created between Repeating and Composing, mediated by these emergent technologies.

According to Attali, "Representation made repetition possible by means of the stockpile it constituted. And repetition created the necessary conditions for composition by organising an amazing increase in the availability of music."<sup>59</sup> This point also catches my eye, given the continued boom of music distribution over the internet. Over the past decade, file sharing (or 'peer-to-peer') programs have allowed users to share their music collections with one another across the world. From Attali's descriptions of the necessary conditions for the phase of Composition to emerge, it seems there has never been a better time for Attali's Composer to flourish, though Susan McClary's afterword adds a disclaimer: "For in Attali's eyes, only if the individuals in society choose to re-appropriate the means of producing art themselves can the infinite regress of Repetition be escaped."<sup>60</sup>

Could it be that Attali's Composer exists at work among the sea of digital information on the internet? The suitable conditions appear to exist, as Repetition creates the necessary stockpile of accessible music for Composition to emerge. In our age of file-sharing, we have almost unlimited access to each other's music collections, as well as being able to purchase and download digital music. This marks an interesting departure from the traditional sale and consumption of physical music, with music traded as digital information. Indeed, Attali acknowledges this, illustrating the difficulties in managing information on an economic basis:

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<sup>58</sup> Adorno, Theodor W., *Essays on Music* (University of California Press, 2002), p. 115.

<sup>59</sup> *Ibid.*, p.136.

<sup>60</sup> Attali, *Noise*, p. 156.

The whole of economic theory is the theory of scarce resources. If milk is scarce, the price is up: this is economic theory. But it doesn't work for music; it doesn't work for information as a whole. If I have a pot of milk and give it to you, I don't have it any more. But if I give you a piece of information I still have it, I keep it. Which means that if I give something to you I create something new: abundance. And this means that economic theory doesn't work for information, when that information can be separated from its material support—a CD, or whatever is the case today.<sup>61</sup>

This illustrates the difference between selling music in the form of a tangible analogue music format, such as vinyl or music cassette tape for example, and selling CDs and dematerialised mp3s. 'Limited edition' CDs may command higher prices because of their physical scarcity compared to the standard run of CDs, yet when the same limited edition becomes encoded and introduced to file-sharing networks, duplicated thousands of times over the world, the physical scarcity of the release has considerably less impact.<sup>62</sup> The physical format of the CD and the digital information contained beneath its surface can be separated from each other far too easily, unlike analogue formats such as vinyl and analogue tape, which feature transcribed information as a physical component of the format itself. The digital medium is far too promiscuous with its sharing of information to be considered scarce or unique; the superficial relationship between digital information and its physical carrier medium affirms this. I would then offer a clarification to Attali's above quote, and state that the economic theory of scarce resources does not work for *digital* music. This takes Walter Benjamin's notion of mass-production as diminishing an artwork's unique 'aura' of originality to new levels. Digital formats can be duplicated perfectly, retaining the 'originals' yet existing as bit-for-bit copies of them.<sup>63</sup> It makes little sense in such an environment to even differentiate between original and copy; dematerialised music seems apt as a quintessentially post-auratic work.

There is a shift of focus, then, from the value of the information or commodity itself to the value of the network within which the information spreads; as Attali states: "the value of a good increases with its scarcity. The value of an information tool, such as language or a telephone network, is increased by the number of users."<sup>64</sup> The implications for the online

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<sup>61</sup> Jacques Attali, *The Wire* (July 2001).

<sup>62</sup> In such a situation, the physical portion of the music will therefore only be of interest to collectors and completists, such as Eisenberg's 'Clarence' character. That is, only those not interested in the music's actual use-value will consider it a scarcity.

<sup>63</sup> Walter Benjamin's influential 1936 essay, *The Work of Art in the Age of Mechanical Reproduction*, argues that the mechanical reproducibility of a work of art removes its 'aura', i.e. its authentic uniqueness in time and space, and its concomitant ritual use-value. I shall be discussing how Benjamin's notion of aura relates specifically to my practice and the online economy, in the next chapter.

<sup>64</sup> Jacques Attali, interviewed in *Vibro* magazine, <[www.vibrofiles.com/essays\\_attali.php](http://www.vibrofiles.com/essays_attali.php)> (Accessed 14th

music economy are significant, as the ‘value’ of music becomes dependent upon the extent of its distribution and permeation, rather than any single piece of music’s individual price. This troubling mismatch between the online and offline economy has led to the sky-high valuations of dot.com services and companies, regardless of whether or not money changes hands through their use. From a musician’s perspective, it seems certain that under such an economic guideline, the music aggregators and network service providers hold all the cards when it comes to making money from online music; it would appear then that Repetition has strengthened its grip. Accordingly, rather than the fantasised revolution of decentralisation, a more grounded assessment would note a simple shift in power from one centralised corporation to the next. Music obviously holds value to us, but in a stark contrast to the materialised formats of CD, vinyl etc., the terms or grounds on which we decide to place value in music is uncertain. However, from the perspectives of the listener, the unprecedented access to new musical modes of reception, afforded by Repeating, is very much a positive outcome.

We are therefore in the unique and uncomfortable position of having to artificially place a price on information, as with music stores such as iTunes and the long-since legalised Napster, whose rationale lies outside of the traditional rules of economic theory. Indeed, music is first to successfully readjust to an economy of the infinite and immaterial, and would seem to portentously pave the way for similar ventures within the television and film industries, such as digital TV and film ‘on demand’.<sup>65</sup> If we take account of Attali’s claim that music is a harbinger of social change, then might we interpret music as foreshadowing an age of increasing corporatisation within an all-subsuming information economy, and furthermore, a loss of value in the musical object and an increase in value of its distributive system, as management over production? We are already witnessing the technological push towards the consumption of eBooks in very much the same manner as our dematerialised music (and to a lesser extent, film) consumption, even through the same single-company services such as iTunes or Amazon, all vying for control of our leisure time—our use-time. All are outcomes that are at-odds with the utopian vision invoked by Composing.

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<sup>65</sup> Whereby we see an increased fragmentation of television that began with pay-per-view, progressing towards a non-broadcasted atomising of programming. A pick ‘n’ mix of individual TV series’ episodes and films available on-demand from a digitised server-stored collection, available either as one-off small single fee or as part of a subscription or licence. Like music, television essentially becomes part of the internet.

Placing a value on music's use-value rather than its traditional commodity exchange-value creates some interesting problems when considering the mp3 as a cultural artefact analogous to a CD or vinyl LP. Attali notes the following paradox concerning music's initial transition from use-value to exchange-value following the introduction of sound recording:

We must not forget that music remains a very unique commodity; to take on meaning, it requires an incompressible lapse of time, that of its own duration. Thus the gramophone, conceived as a recorder to stockpile time, became instead its principle user. Conceived as a word preserver, it became a sound diffuser. The major contradiction of repetition is evident here: people must devote their time to producing the means to buy recordings of other people's time, losing in the process not only the use of their time, but also the time required to use other people's time. Stockpiling thus becomes a substitute, not a preliminary condition, for use. People buy more records than they can listen to. They stockpile what they want to find the time to hear. Use-time and exchange-time destroy one another.<sup>66</sup>

Attali's reasoning is extremely reminiscent of Adorno's concerns regarding the distinctions between the exchange-value and use-value within music commoditisation, placing this friction at the heart of his 'fetish-character'.<sup>67</sup> As a computer musician, I have to ask myself if I wish to contribute to the glut of online stockpiled recordings, as the economic value of dematerialised music approaches zero. This is another area within which the boundaries between Composing and Repeating become indistinct, and where the technologies and opportunities that in one light appear to offer the fertile circumstances from which the Composer can emerge, simultaneously appear to strengthen Repetition's grip on the musical climate at large.

Attali continues, referencing Benjamin's ideas regarding the 'aura' of uniqueness and originality: "Reproduction, in a certain sense, is the death of the original: in mass production, the mould has almost no importance or value in itself."<sup>68</sup> While Attali had industrial mass-production in mind when he wrote this, it becomes even more pertinent when considering the self-similar perfection of digital replication, as well as its potentially relentless propagation

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<sup>66</sup> Attali, *Noise*, p. 101.

<sup>67</sup> "If the commodity in general combines exchange-value and use-value, then the pure use-value, whose illusion the cultural goods must preserve in completely capitalist society, must be replaced by pure exchange-value, which precisely in its capacity as exchange-value deceptively takes over the function of use-value." Adorno, *Essays on Music*, p. 296. Eisenberg re-iterates this more clearly as a record consumer: "When I buy a record, the musician is eclipsed by the disc. And I am eclipsed by my own money—not only from the musician's view but from my own. When a ten-dollar bill leaves my right hand and a record enters my left, it is the climax. The shudder and ring of the register is the true music; later I will play the record, but that will be redundant. My money has already heard it." Eisenberg, *The Recording Angel*, p. 20.

<sup>68</sup> Attali, *Noise*, p. 88.

once online.<sup>69</sup> While for an artist, the process is arguably more important than the results, I cannot help but wish for a more substantial artefact to emerge from the fruits of my labour than a collection of musical encodings on a hard disk. If the results of my artistic output have become increasingly dematerialised, then, for reasons that will become increasingly clear throughout this thesis, I should wish to *rematerialise* it. The satisfaction I feel when I complete an album and hold a CD or piece of vinyl in my hand is accompanied by a strong feeling of accomplishment; a goal has been achieved and the project is concluded. A ‘mould’ of sorts exists in the form of multitrack audio files, but as this is now as dematerialised the final music file, a physical artefact feels necessary in the name of permanence. I know through experience that the temptation to continue working on my music, given the ability to perfectly recall a session within the sequencing program, is difficult to resist, leading to the ‘98% complete syndrome’, making it difficult to finish a piece of work. Having your music exist as an mp3 on your own web site is not enough to avoid the temptation to re-work a piece of music, but concluding a project by funding the pressing of CDs or vinyl is very much a final act, allowing one to move on to the next project.<sup>70</sup> This contradiction between extended time spent working on music, against its prompt reification, is a notable incentive for me to produce physical goods, at the very least alongside dematerialised versions, as a productivity measure. These psychological effects on modes of production are considerable.

Regarding modes of reception, Jonathan Sterne also notes that unlike physical commodities, mp3s inherently lack an economic exchange-value,<sup>71</sup> and so we would expect them to be approached by consumers in a different manner.<sup>72</sup> Yet consumers still appear to collect and stockpile mp3s as though they were physical commodities. This apparently inexhaustible supply of music, combined with limited use-time, changes the way music is consumed; in an increasing attempt to maximise use-time, listeners have embraced portable

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<sup>69</sup> The age-old conundrum of the self-replicating machine springs to mind, a concept more recently tackled with the growth of advanced 3D printers, plus projects such as the ‘RepRap’ project, a ‘self-replicating rapid prototyper’ (<http://reprap.org>), which aims to become fully self-replicating (currently it is only 60% self-replicating). The field of nanotechnology also fancies similar aims, employing ‘nanomachines’ or ‘assemblers’ to create matter designed to a subatomic blueprint.

<sup>70</sup> This unwillingness to let go of a project while in a dematerialised state became obvious to me over the course of my burgeoning recording career. My music ‘out-takes’ i.e. pieces that hadn’t been designated for CD releases, were reworked, remastered and reshuffled more times than I care to admit, and so for the sake of finality and permanence, I plan to self-release these on vinyl.

<sup>71</sup> That is to say, the exchange value of an mp3 cannot be measured in a traditional economic sense, e.g. evaluating its scarcity, innate quality of craftsmanship or material value. It is instead the value generated by the power to choose how the mp3 is exchanged. It is this social currency (part of what Sarah Thornton (1995) calls ‘subcultural capital’) that binds and fuels file-sharing networks, in addition to the pure use-value of the file being shared.

<sup>72</sup> Sterne, ‘The mp3 as Cultural Artefact’, *New Media Society*, vol. 8 no. 5 (2006), pp. 825-842.

players (iPods, smartphones etc.). In relying on such technologies, consumers participate in the continued production of demand for music, despite the extant glut of online music, and in turn keep the large aggregators' pockets lined.<sup>73</sup>

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<sup>73</sup> Apple's iTunes is now the largest global music retailer, with a 69% market dominance in the US, <[www.businessinsider.com/chart-of-the-day-whos-eating-itunes-dust-2009-8](http://www.businessinsider.com/chart-of-the-day-whos-eating-itunes-dust-2009-8)> (Accessed 21st September 2010). Amazon mp3, iTunes' closest rival, takes a distant second place with 7.6% market share.

## Chapter 2. Post-Auratic Dematerialisation

It would be tempting to suggest that in embracing portable music, aided by dematerialisation, listeners have relegated music to a background noise, becoming little more than an incidental soundtrack to their lives. This is a familiar, if unconvincing, fear concerning music and its consumption in the technological age, and has perhaps been most notably explored by Adorno.

Adorno's essays on popular music and its surrounding culture ('Mass Culture' is his term; culture churned out for the lowest common denominator by the 'Culture Industry') have become a benchmark of anti-capitalist cultural critique, and clearly form the basis of much of Attali's scornful stance on popular music within *Repeating*. One can almost picture the zeal with which Adorno would tear into the contemporary use of iPods; Adorno pulls no punches when critiquing the phonograph, and the listening habits of those who enjoy music on such devices.

In his 1927 essay, 'The Curves of the Needle', Adorno expounds his concern with the continued and rapidly growing fetishisation of Emile Berliner's gramophone, as a dumb surrogate to the family piano (itself a bourgeois commodity status symbol of its time), stating: "The gramophone belongs to the pregnant stillness of individuals."<sup>74</sup> Here we note the root of Attali's notion of music commoditisation as silencing, separating recording from performance, supplanting Representation with Repetition. Furthermore, we are introduced to the emergence of Attali's aforementioned use-time/exchange-time paradox, concomitant with a deritualisation, as Richard Leppert notes in his commentary, "wherein the aesthetic labour of others is privately heard rather than experienced intersubjectively and socially, as may

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<sup>74</sup> Adorno, 'The Curves of the Needle', *October*, Vol. 55, p. 50. Curiously, Adorno also takes a moment to gloss over a somewhat shaky concern with technological encroachment upon the human (and in this case specifically female) body, and its complicity in divorcing the voice from the body. In declaring the phonograph incapable of convincingly conveying the female singing voice, instead sounding "needy and incomplete", (p. 54.) Adorno betrays an insight into his burgeoning distrust of technology's mediation of music once divorced from the body (entirely understandable, as a composer relying on interpretive performance), foretelling a rich seam of cultural theory examining the dichotomy between 'live' music of the body and 'dead' music of the recording; Attali and Eisenberg would also follow Adorno's lead, as we have seen, entertaining and exploring the notion of 'dead' commodity stockpiling and associated fetishism. We can also understand Adorno's suspicion of the effects of mediated music *on* the body, whether as a pleasurable diversion or gratification, or something altogether more insidious following his first-hand experiences of the conditioning effects of music and radio under Nazi control. As Richard Middleton notes, Adorno's approach "was formed by the early 1930s, and he extends it during the 1940s only in the direction of even greater pessimism: cultural 'totalitarianism' becomes absolute." Middleton, *Studying Popular Music*, p. 35.

occur in musical ritual, whether ecclesiastical or secular.”<sup>75</sup> With the advent of the Walkman, music becomes even more private, taken to the extreme with the iPod, abundant with use-time. The swapping of cassette mix tapes, a popular social activity in the medium’s heyday, has been absorbed within the technological frame. Our sharing of music is now online, as we decide what to add to our music libraries within iTunes, in preparation for our next iPod ‘sync’.

Adorno followed his ‘Curves’ essay in 1934 with ‘The Form of the Phonograph Record’, a brief essay scrutinising the physical recording medium itself, rather than the gramophone. Adorno begins with a cautious cursory assessment of the phonograph’s physical properties, describing it with an almost reverential wonder: “Fragile like tablets, with a circular label in the middle ... at the very center, a little hole that is at times so narrow that one has to redrill it wider so that the record can be laid upon the platter.”<sup>76</sup> Although marvelling at this delicate wafer of music, Adorno seems less entranced by its primary function, as though questioning how it is possible for such a thing to be traded and fetishised: “It designates the two-dimensional model of a reality that can be multiplied without limit, displaced both spatially and temporally, and traded on the open market. This, at the price of sacrificing its third dimension: its height and its abyss.”<sup>77</sup> However, the most pertinent point of Adorno’s ‘Form’ essay is his insight into the recording as a document of sound; his description of the phonograph as “covered with curves, a delicately scribbled, utterly illegible writing.”<sup>78</sup> Adorno’s respect for music saves the would-be commodity from the kind of vituperative assessment he would later be characterised by, for he acknowledges the permanence of the phonograph in very much the same manner as a stone tablet, linking music and writing:

There is no doubt that, as music is removed by the phonograph record from the realm of live production and from the imperative of artistic activity and becomes petrified, it absorbs into itself, in this process of petrification, the very life that would otherwise vanish. The dead art rescues the ephemeral and perishing art as the only one alive. Therein may lie the phonograph record’s most profound justification, which cannot be impugned by an aesthetic objection to its reification.<sup>79</sup>

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<sup>75</sup> Leppert, Richard, in Adorno, *Essays on Music*, p. 234.

<sup>76</sup> Adorno, ‘The Form of the Phonograph Record’, *October*, Vol. 55 (Winter 1990), p. 56.

<sup>77</sup> *Ibid.*, p. 57.

<sup>78</sup> *Ibid.*, p. 55.

<sup>79</sup> *Ibid.*, p. 59.

It is the phonograph record's saving grace as a reified, codified musical script, a "scriptal spiral"<sup>80</sup> that physically describes the frequency and amplitude of vibrations across time, rather than a set of performative instructions (such as a score), which Adorno finds valuable (the word 'phonograph', after all, derives from its Greek origins, translated literally as 'sound writer'). It achieves an archival and historical permanence hitherto unavailable, and arguably still remains the most stable reification of music, especially since the tenuous status it has acquired through digitisation, not to mention dematerialisation. Interestingly, as recording formats have progressed throughout the last century, through magnetic analogue and digital technology, it does indeed appear that the phonograph record (or modern variant thereof) would remain at the zenith of fulfilling the criterion of archival record or document. With each successive technological step, an extra layer of abstraction has been inserted between the music format and its musical, acoustic decoding, despite the accompanying increase in reproduction sound quality.<sup>81</sup>

Digital dematerialisation is an extreme illustration of the developing gulf between the scriptal origins of recorded music and its latest incarnation, also noted by Auslander using this quote from Baudrillard's *Simulations*:

And here it is a question of a reversal of origin and finality, for all the forms change once they are not so much mechanically reproduced but even conceived from the point of view of their very reproducibility, diffracted from a generating nucleus we call the model. ... Here are the models from which proceed all forms according to the modulation of their differences.<sup>82</sup>

As Auslander reiterates, "The code and model is the binary code that defines all products of digital technology, products that differ from one another only according to different modulations of the common code from which they are all diffracted."<sup>83</sup> As part of the online

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<sup>80</sup> Adorno, 'The Form of the Phonograph Record', *October*, p. 60.

<sup>81</sup> With the introduction of tape machines, which instead use magnetic flux to store audio on ferric oxide dust-covered tape, music once again becomes invisible to the naked eye, and for playback becomes increasingly technologically dependent; no longer can we glimpse at the dormant music before its reanimation. The transition from magnetic analogue to digital only served to further abstract the music relative to its medium, literally encoding the audio as a series of binary fragments or bytes, pertaining to a particular encoding format (codec). Within each technological iteration, the recording itself becomes less opaque, sidelined relative to its commodity vessel i.e. the cassette tape, CD, iPod etc., with the music becoming subsumed as just another computer file, as nondescript data without the correct means of decoding. As digital information, stretching and finally rupturing its link with its physical format, music recordings have finally coalesced with myriad other computer files as part of a monolithic network of information. "Inside the computers themselves, everything becomes a number: quantity without image, sound, or voice." (Kittler, Friedrich A., *Gramophone, Film, Typewriter*, p. 1.)

<sup>82</sup> Baudrillard, Jean, *Simulations* (1983), pp. 100-101, cited in Auslander, Philip, *Liveness* (Routledge, 1999), p. 104.

<sup>83</sup> Auslander, *Liveness*, p. 104.

digital edifice, dematerialised music is no different from any other software: “There is no intrinsic difference between the binary code on a music disc and the code in the software that controls the launching of missiles.”<sup>84</sup>

It would be tempting to paraphrase Arthur C. Clarke, and say that to access and playback music, as one of myriad modulations of digital data, within such a technology, is indistinguishable from magic.<sup>85</sup> Furthermore, the transformation from CD to dematerialisation will no doubt affect how we value music, not to mention how we consume it. While from a consumer standpoint, the many advantages afforded by dematerialised music appear to outweigh the disadvantages, as a composer I feel I need to remain sceptical and critical of the increasingly totalising effects of the information economy. The ability to distribute my music online, simply by uploading mp3s to my own website is undoubtedly a bonus for musicians; however, I am aware of just how dependent I am on the computer for almost every musical task I undertake on a daily basis. Whether I’m writing music, mastering other musicians’ music, uploading my music, developing and updating my website, purchasing and listening to music, shopping, writing emails, contacting fans and friends on Facebook, updating my Twitter feed, or writing this thesis, it is all mediated by my computer, via the screen I gaze at and the keyboard and mouse I manipulate. As far as my body is concerned, I am physically carrying out a single task, as all the aforementioned activities have been subsumed within the literal frame of my computer monitor—a single portal into my musical existence, which, once closed, leaves little evidence of my activities, as my hardware synthesisers and samplers are gradually replaced by software. Consequently, in addition to a conclusive physical artefact as fruits of my labour, I wish to re-introduce a physical engagement with my music, a multi-sensory crafting, to reclaim part of my practice from the computer. The freedom to create and distribute my music over the internet is sullied by my need to remain anchored to the computer; the myriad liberating modes of reception owing to Repeating have yet to mirror similar modes of production in my own practice.

Attali’s issue of recordings as an “incompressible lapse of time”, resulting in the “valorization of very short works”,<sup>86</sup> is shared and explored by Evan Eisenberg, opining that music, as uncompromising in its temporal linearity, “does not lend itself to being scanned or

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<sup>84</sup> Auslander, *Liveness*, p. 104.

<sup>85</sup> “Any sufficiently advanced technology is indistinguishable from magic.” This is one of three of ‘Clarke’s Laws’, taken from his technoromantic/futurist non-fiction work, *Profiles of the Future* (Pan Books, 1973), p. 21.

<sup>86</sup> Attali, *Noise*, p. 101.

searched or ‘surfed’” by listeners.<sup>87</sup> The way we seek, collect and consume music online may well then be incompatible with the way we listen to the music once we have it on our hard disks. As Eisenberg implies, our endlessly distracted and fragmented online multitasking cannot possibly serve our listening needs as required by an hour of liquid audio. Indeed, we are seeing an increasing consumption of singles rather than albums; with services like iTunes, Pandora and Spotify, the cherry-picked singles playlist dominates the album (at the very least, we need not suffer albums stuffed with ‘filler’ any longer).<sup>88</sup> The seldom-used ‘shuffle’ feature on our CD players finally makes sense on our iPods, filled with a variety of single tracks. Our previously compartmentalised actions as consumers, first discovering music, then purchasing and finally listening to it, have joined the soup of our daily diversions and distractions (a consequence exacerbated by our mobile internet boom—our emails granulated into Tweets).<sup>90</sup> Consequently, taking his cue from Adorno regarding the technological mediation of music as regressive and pacifying, Eisenberg concludes that digital music can only continue to become whittled-down to “hooks, riffs, melodic fragments ... music is now a soundtrack for catchy words and captivating images. All music aspires to the condition of the jingle.”<sup>91</sup> However, as we shall see later in this chapter, the modes of reception employed in our online, digital age have adapted accordingly, accommodating the varied circumstances through which we experience music, and derive meaning from this active agency. To side with Eisenberg would assume a single static mode of listening, anchored to the phonograph.

The contrast between Attali’s utopian Composing and his critical account of Repeating appears to be unyielding and resolute, yet typically, the reality exists in a nebulous grey area open to interpretation, between these two phases. If we can interpret aspects of an age of decentralised mp3 distribution over the internet as signs of an impending era of

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<sup>87</sup> Eisenberg, *The Recording Angel*, p. 89. However, that is not to say that we cannot instead employ technology to, in effect, scan, skip or surf through music for us to help identify a piece of music we have heard but cannot name. Michael Casey’s omras2 software (i.e. Online Music Recognition And Searching, [www.omras2.org](http://www.omras2.org)), for example, allows users to create so-called ‘annotations’ of pieces of music, metadata describing the harmonic make-up of individual pieces, which can then be added to existing music databases. omras2 also includes retrieval tools used to search these indices and identify similar pieces of music to a designated source piece, thus potentially assisting new music discovery. In the decidedly more populist realm, we are witnessing the emergence of iPhone apps that claim to offer a similar functionality, such as Midomi, Shazam and Soundhound, all of which claim to be able to identify snippets of music, or even identify music as hummed into the phone.

<sup>88</sup> For example, articles discussing the demise in popularity of the album:

<[www.hypebot.com/hypebot/2010/05/graphic-proof-of-the-death-of-the-album.html](http://www.hypebot.com/hypebot/2010/05/graphic-proof-of-the-death-of-the-album.html)>

<<http://arstechnica.com/tech-policy/news/2010/05/the-death-of-the-album-in-handy-graph-form.ars>>

<[www.guardian.co.uk/media/pda/2008/aug/29/thedeathofthealbum](http://www.guardian.co.uk/media/pda/2008/aug/29/thedeathofthealbum)> (All accessed 20th September 2010).

<sup>90</sup> ‘Tweets’ being the name given to individual messages under 140 characters in length on the popular online messaging/broadcasting platform, Twitter.

<sup>91</sup> Eisenberg, *The Recording Angel*, p. 215.

Composition, we can equally interpret iTunes and similar stores as a level of entrenching Repetition; we might then designate the present as a hypercommodified extension of Repeating.

When, within the same sentence, Attali suggests that this mode of power is simultaneously “exacerbating the fiction of the spectacle as a mode of government”,<sup>93</sup> and yet in the next sentence suggests that the stockpiling of music recordings portends an end to our society of the spectacle, we again find ourselves at odds with our present situation. For Attali, recorded music appears to be a supplanting of performance, and leads to the elimination of Representation and the isochronic spectacle. Yet as the online exchange of abundant dematerialised music (as records of a supposed ‘performance’) devalues recorded music by negating the economics of scarcity, we see the opposite occur: a re-appreciation and subsequent monetising of the live spectacle (i.e. music concerts, performances and installations) as an authoritative and ‘authentic’ mode of production.<sup>94</sup> Repeating, in this instance, reinforces Representation rather than undermines it, by reminding us of the auratic qualities that are inherently diminished by dematerialisation.

## **2.1 The Adorno-Benjamin Debate: Mapping Modes of Production and Reception**

The debate between Adorno and Benjamin concerning music’s function and use in society is still highly relevant today, for through their debate we witness how their standpoints are reflected at the core of Repeating and Composing respectively, mapping on to these phases with a striking resonance. Their different perspectives are very useful at illustrating the differences between Attali’s Repeating and Composing, depending on whether one’s considerations focus primarily on modes of production or modes of reception; this will also bias our conclusions on whether we perceive our current musical climate as best described by Repeating, or signalling the dawn of Composing. Similarly, whether we deem these stages as emancipatory or repressive also comes down to which side of the production/reception divide our standpoints sit.

Benjamin was unable to subject recorded sound, as an art form, to the kind of scrutiny he applied to the visual arts—recorded music, after all, was barely half a century old by the time ‘Work of Art’ was published, and for Benjamin could not offer as rich a retrospective to

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<sup>93</sup> Attali, *Noise*, p. 88.

<sup>94</sup> Though, as Philip Auslander reminds us in *Liveness* (1999), this facade of authenticity is often fraught with contradictions and complications.

dissect as the many preceding centuries of visual arts. Recorded sound gets scant mention, and when it does receive attention, it is merely used to help illustrate the extensible if, in Benjamin's view, somewhat compromised ability of reproductions to "enable the original to meet the beholder halfway, be it in the form of a photograph or a phonograph record."<sup>95</sup> However, in debating with Adorno, Benjamin provides us with an insight into how his views towards technologically mediated art can apply to recorded music, sounding-off against Adorno's beliefs.

The ephemeral and transitory nature of sound is distinctly at odds with the revered, contemplative permanence of the fresco, statue, or other exhibition works of visual art with a clear ritualistic precedence. For Benjamin, visual art throughout the ages has followed a comparatively slow, gradual progression, accelerating in its ability to capture and accurately convey reality, culminating with the motion picture: "Lithography enabled graphic art to illustrate everyday life, and it began to keep pace with printing ... Since the eye perceives more swiftly than the hand can draw, the process of pictorial reproduction was accelerated so enormously that it could keep pace with speech."<sup>96</sup> Conversely, since its relatively abrupt inception just under a century and a half ago, recorded sound has existed for a relatively short period of time before being subsumed by capitalist modes of mass production. As such, it suits a more compartmentalised periodising, as employed by Attali, for instance.

According to Benjamin's thesis, mass reproduction withers an artwork's aura, in favour of widespread access, availability and subsequent portability, as "the technique of reproduction detaches the reproduced object from the domain of tradition. By making many reproductions it substitutes a plurality of copies for a unique existence."<sup>97</sup> Benjamin remains optimistic of the emancipatory potential of technology, a severe bone of contention in his correspondence with Adorno at this time, though as importantly noted by Richard Leppert, this optimism is firmly from the perspective of reception, rather than production.<sup>98</sup>

The aura of a unique work of art may indeed wither if the artwork is subject to mediating technologies not factored into its creation, as in the case of ritual works of art,

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<sup>95</sup> Benjamin, Walter, 'The Work of Art in the Age of Mechanical Reproduction', *Illuminations* (Pimlico, 1999), p. 214.

<sup>96</sup> *Ibid.*, p. 213.

<sup>97</sup> *Ibid.*, p. 215.

<sup>98</sup> Leppert, in Adorno, *Essays on Music*, p. 245. Within 'Work of Art' at least; in 'The Storyteller', Benjamin's technological outlook becomes somewhat less optimistic, turning accusatory as the art of storytelling (as a group dynamic) is lost to the rise of the novel (as an alienating, amputating technology in the McLuhanistic sense).

paintings, frescoes, sculptures and so forth.<sup>99</sup> But for works of art that depend inextricably on technology and reproducibility as core constituents of their very form—as Benjamin argues is the case with film—a very different dynamic exists between the production and reception of a reproduction. Instead of adversely affecting the ‘authenticity’ of the ‘original’, thus diminishing aura, Benjamin argues that with cinema we witness an empowerment resulting from, and dependent on, its media multiplicity. “For the first time in world history, mechanical reproduction emancipates the work of art from its parasitical dependence on ritual. To an ever greater degree, the work of art reproduced becomes the work of art designed for reproducibility.”<sup>100</sup> Rather than relying on ritual value in the domain of tradition, such an artwork now thrives within the socio-political ecology, though as I will argue shortly, freedom from ritual within the domain of tradition does not engender a disconnection from other, quotidian ritual meanings.

Adorno takes a suspicious and critical stance against the gramophone, appearing conflicted concerning the phonograph record, and sees the emancipation that Benjamin argues for as irredeemably tainted by commoditisation. Initially conceived through his critical exchange with Benjamin, his scathing polemic, *On the Fetish-Character in Music and the Regression of Listening*, criticised what he saw as a fetishisation of music commodity consumption, as well as a correspondingly regressive, passive mode of listening. In contrast to Benjamin’s optimistic view of technology as a democratising force for liberation, Adorno viewed the technological mass-mediation of art with much greater scepticism, acting more as a suppressive force than anything remotely emancipatory. However, Adorno did emphatically endorse Benjamin’s core hope for technology to demystify inaccessible bourgeois ‘high’ art, catalysing “the liquidation of the traditional value of the cultural heritage”,<sup>101</sup> but he did not subscribe to Benjamin’s belief that the use of technology necessarily nullifies ritual value.

Benjamin’s propounding of the slow continuum in the visual arts, progressing from the ritual and ‘auratic’ artwork on one side, to the technologically-mediated and ‘democratised’ film on the other, gives rise to a corollary emancipation of the beholder. Benjamin suggests that “a man who contemplates a work of art is absorbed by it. He enters

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<sup>99</sup> We are all likely aware of the enthusiastic futility with which we engage in photographing works of art in a gallery (when permitted), only to be disappointed by the resulting photographs. The very reason why we would need to personally document such prolifically reproduced pieces is amusingly touched upon by Stuart Jeffries in his article for the Guardian, “The Rise of the Camera Phone.”

<[www.guardian.co.uk/technology/2010/jan/08/stuart-jeffries-camera-phones](http://www.guardian.co.uk/technology/2010/jan/08/stuart-jeffries-camera-phones)> (Accessed 14th September 2010).

<sup>100</sup> Benjamin, *Illuminations*, p. 218.

<sup>101</sup> *Ibid.*, p. 215.

into this work of art the way legend tells of the Chinese painter when he viewed his finished painting.”<sup>102</sup> In this manner, it is the artwork that absorbs the contemplative viewer, not vice-versa, because as Richard Leppert notes, “the artwork colonizes the viewer, though less by what it is, more because of what it has become (a cult object).”<sup>103</sup> The ritual work of art entrances us through its auratic properties, its ritual site and associated culturally appointed deference, and we are thus at its mercy. Film, on the other hand, according to Benjamin, does not permit such contemplative passivity, as it is sufficiently familiar to everyday life for us not to require our undivided concentration. Instead, film is continually jarring from one ‘shock’ edit to the next, eliciting active viewing in compensation for this sustained shock distraction; “the distracted mass absorbs the work of art.”<sup>104</sup>

But, perhaps as an attempt to temper this technological optimism, Benjamin closes his essay with a concession towards the habituation of this distraction:

The distracted person, too, can form habits. More, the ability to master certain tasks in a state of distraction proves that their solution has become a matter of habit ... The film makes the cult value recede into the background not only by putting the public in the position of the critic, but also by the fact that at the movies this position requires no attention. The public is an examiner, but an absent-minded one.<sup>105</sup>

These final sentiments appear to be echoed later by Susan McClary regarding Composing, in her afterword to *Noise* (as mentioned earlier), in that we may identify and attribute potentially emancipatory factors to media technologies, but which remain latent unless we choose to act upon these liminal opportunities. For Benjamin, the once privileged tools of liberation have been unlocked, ‘democratised’ and distributed, and thrown at our feet, yet the last choice remains ours to decide whether to pick them up and use them.

Typically, Adorno feels Benjamin gives the viewer far too much credit, and accuses Benjamin of being overly romantic: “The idea that a reactionary individual can be transformed into a member of the avante-guard through an intimate acquaintance with the films of Chaplin, strikes me as simple romanticization.”<sup>106</sup> In fact, film—the medium Benjamin regards as post-auratic, for having no ritual value or original copy—is considered

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<sup>102</sup> Benjamin, *Illuminations*, p. 232. The myth recounts a landscape mural painted by 8<sup>th</sup> century artist, Wu Daozi, commissioned by Emperor Xuanzong of the Tang Dynasty. So rich and lifelike was the mural, it was purported that on admiring his completed work, the artist was able to enter the painted landscape, physically absorbed by it.

<sup>103</sup> Leppert, in Adorno, *Essays on Music*, p. 242.

<sup>104</sup> Benjamin, *Illuminations*, p. 232.

<sup>105</sup> *Ibid.* pp. 233-234.

<sup>106</sup> Adorno and Benjamin, *The Complete Correspondence* (Polity Press, 1999), p. 130.

by Adorno to possess an “auratic character ... to an extreme and highly suspect degree.”<sup>107</sup> For Adorno, the cinema as a motion picture temple is no different to an art museum, and as such retains the same site-specific aura, with its own codes and rituals (contemporarily, what is popcorn snacking if not a site-specific ritual? One can imagine the resulting outcry from a move against the *traditional* lobby-sale of popcorn).<sup>109</sup> As Richard Leppert notes, advertising and marketing hype, trailers and promotional interviews, the cult of the superstar, are all artificial boosters supporting the aura surrounding cinema.<sup>110</sup> Once in place, these mechanisms that serve to create a simulacrum of aura are perpetuated through familiarity and unquestioned repetition (a trait Adorno would also level at popular music). Adorno seizes the opportunity to suggest that Benjamin focuses too narrowly on the medium of film itself, with a typically techno-centric romanticism, without fully considering the surrounding social practice through which ritual meaning is created. Indeed, Adorno challenges Benjamin’s view of film as empowering the proletariat, suggesting that in becoming entrenched in the technological potential of film, he has not considered the balanced axial dialectics between film as low/dependent art and high/autonomous art: “You underestimate the technical character of autonomous art, and overestimate that of dependent art.”<sup>111</sup> Although technology for Benjamin is seen as potentially emancipatory, Adorno suggests its use can also be employed to enforce the dominant market ideology, promising freedoms that will never arrive while ensuring continued turnover; both high and low art “bear the stigmata of capitalism ... Both are torn halves of an integral freedom, to which, however, they do not add up.”<sup>112</sup>

Benjamin’s closing disclaimer regarding inattention strays closest to Adorno’s sentiments concerning the reception of mass media. Yet while for Benjamin the state of distractedness during the viewing of a film is, at least until habituation, a mode of empowerment and emancipatory potential, it is this exact same mode that Adorno criticises regarding the reception of pop or ‘mass’ music within his ‘Fetish Character’ essay. Adorno describes the ensuing ‘passive’ listening mode to result from music fetishism as losing “the capacity for conscious perception of music”, “fluctuating between comprehensive forgetting

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<sup>107</sup> Adorno and Benjamin, *The Complete Correspondence*, p. 130.

<sup>109</sup> Some cinemas are exploring a ban on popcorn as a direct attempt to market themselves as a more sophisticated class of cinema, above such mass-market exploits as the sale of popcorn—a high-profit salty/sweet snack encouraging the consumption of similarly profitable drinks.

<sup>110</sup> Leppert, in Adorno, *Essays on Music*, p. 244. It would certainly be difficult to imagine Benjamin being quite so optimistic about film had he witnessed the industrial scale of modern-day multi-screen cinema multiplexes.

<sup>111</sup> Adorno and Benjamin, *The Complete Correspondence*, p. 131.

<sup>112</sup> *Ibid.*, p. 130.

and sudden dives into recognition”, listening “atomistically”.<sup>113</sup> Akin to Benjamin’s ‘shock’ edits, combining the familiar with the technologically-imposed unfamiliar (resulting in his illustrative ‘orchid in the land of technology’), Adorno denigrates the standardisation in pop music song formats likening it to the “inconspicuous familiar and the unfamiliar conspicuous”<sup>114</sup> blueprint that he also recognised in advertising. For Adorno, the instant gratification of memorised hooks and ‘hit lines’ among otherwise familiar yet slightly different pieces of music, engendered a mode of ‘deconcentration’, analogous to Benjamin’s absent-minded critic: “Benjamin’s reference to the apperception of the cinema in a condition of distraction is just as valid for light music.”<sup>115</sup>

Here it becomes apparent how the analyses of Adorno and Benjamin differ, with both parties betraying their respective dialectic lines of enquiry. As mentioned earlier, Benjamin is fascinated and preoccupied with technologically mediated modes of reception, and in a distinctly technoromantic sense, how these modes offer emancipatory potential. He examines the route from the unique, enveloping and contemplative auratic art, steeped in tradition and ritual, to an empowering accessibility; when viewed through Attali’s framework, Benjamin identifies technology as the emancipatory potential for Composing.

Adorno, on the other hand, is fixated on the dichotomous relationship between what he calls ‘autonomous’ art and ‘dependent’ heteronomous art (i.e. commoditised or politicised art), examining the social function of each.<sup>116</sup> Following a similar trajectory to Benjamin, Adorno sees dependent art as having an inextricable social function, such as religious music, in contrast to autonomous art or music, such as serialism (Adorno typically cites the music of Schoenberg as an example). Unlike Benjamin, Adorno does not consider technological mediation as a catalyst of autonomy, and instead views technological agency with suspicion, for in his view it allows the ‘culture industry’ to create and fulfil the cycle of commodity fetishism with increasing efficiency (creating and sustaining the ‘Fetish-Character’ in music). Relating this to Attali, we can identify this ideology as the foundation to Repeating.

The views of Benjamin and Adorno, regarding their respective standpoints of reception and production, can be read into the contemporary issues facing musicians. Benjamin’s views are reflected in the fantasies of myriad technologists and tech-evangelists, for whom our online disintermediation and interconnectivity are a tantalising glimpse of a

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<sup>113</sup> Adorno, *The Culture Industry* (New York, London: 1991), p. 46.

<sup>114</sup> *Ibid.*, p. 48.

<sup>115</sup> *Ibid.*, p. 49.

<sup>116</sup> Adorno, *Aesthetic Theory*, (London: Routledge, 1984).

future techno-centric liberation, celebrating the release of the industry stranglehold on work dissemination. Counter to this optimistic romanticism we have Adorno's stance representing the producers (the musicians within such an economy), wary of the mechanisms and modes of production that will dictate not just if and how the music we produce will be received, but how these modes of production and reception/consumption, in turn, affect what we create or produce.

Crucially, if like Adorno, you are critical of the consequent modes of production given rise to by Repeating, then Composing will forever remain a distant dream. If, on the other hand, you acknowledge the myriad modes of reception afforded by Repeating (in improving access and availability to more music than ever before), then you will surely conclude that an age of Composing is already underway.

## **2.2 Aura and Re-Ritualising Repetition**

The monolithic understanding of Repeating, as posited by Attali, supported by Adorno and promoted by Eisenberg, starts to unravel when we examine the varied modes of reception made available by Repeating's technological and infrastructural expansion. Additional complications arise through the use of portable, ubiquitous music, when viewed with a single binary understanding of how we listen to music.

Rather than resulting in a "generalisation of Representation",<sup>117</sup> the superabundance of recordings has led to an acute reassessment of Representation. Not only does live performance become more valuable as a unique spectacle, it also becomes a more reliable commodity, resulting in the largest musical acts leveraging ticket prices to an all-time high, which by all accounts we will still happily pay for.<sup>118</sup> Although it would be dangerous to carry this assumption across the board and suggest the same applies to independent recording artists, the unwitting re-appreciation of live performance is certainly one positive consequence of Repeating. Once again, the enhanced modes of reception created by Repetition appear at odds with Attali's critical Marxian portrayal.

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<sup>117</sup> Attali, *Noise*, p. 95.

<sup>118</sup> Example reports: The Chicago Tribune reports on the doubling of concert ticket prices within the past decade, partly due to increasing monopolisation of the Clear Channel, Ticketmaster and Live Nation companies (<http://archives.chicagotribune.com/2009/feb/11/business/chi-wed-kot-ticketmaster-feb11>). An Entertainment Weekly report from 1997 also shows a steep increase in ticket prices within the past fifteen years. <[www.ew.com/ew/article/0,,288002,00.html](http://www.ew.com/ew/article/0,,288002,00.html)> (Accessed 12th September 2010). Similarly from MSNBC, <[www.msnbc.msn.com/id/4601934/](http://www.msnbc.msn.com/id/4601934/)> (Accessed 12th September 2010).

As noted by Eisenberg, when we consider Benjamin's thesis with regard to recorded music, it does not appear to mesh with a removal of ritual use-value, hand in hand with its aura, through its reproducibility. Benjamin's case is clear: "It is significant that the existence of the work of art with reference to its aura is never entirely separated from its ritual function. In other words, the unique value of the authentic work of art has its basis in ritual, the location of its original use-value."<sup>119</sup> Eisenberg argues that this may hold true for the visual arts, occurring in one-dimensional space, but for recorded or dematerialised music we encounter a re-ritualising of music dependent on its very repeatability. "Photogravure reproduces an art *object*, proliferating it in space. This, Benjamin says, cheapens its ritual value, which depends less on the observable qualities of the object than on its *haecceity* or 'thisness', its unique identity. Phonography, by contrast, reproduces an art *event*, proliferating it in time."<sup>120</sup> But as Eisenberg continues to clarify, although an event implies a unique spectacle, it must repeat if it is to have ritual value. In this respect, live performances have become valuable amidst a superabundance of recordings precisely because of their lack of ritual repetition, as a unique event in time. "To have ritual value an event must recur. In other words, it must not be an historical event at all, but an instance of something timeless."<sup>121</sup>

Timelessness is the exact quality studio musicians strive to achieve; modern music recordings are no longer documents of time, no longer 'records' of a portion of time, of a performance or an event, but are repeatable portions of time *as* an event, and this is where ritual value is derived. Rather than Attali's gradual removal of the ritual channelling of violence within music in each stage throughout *Noise*, Repeating re-injects a substitute ritual value into recordings.<sup>122</sup> Studio musicians, such as myself, do not specialise in recording performances, as there are often no performances involved in the creation of such recordings. Instead the act of composition is a slow, stratified, and highly iterative process that creates a recurring event to be initiated by the listener. Eisenberg writes about the associative ritual on the part of the listener throughout his 'Ceremonies of a Solitary' chapter, concerning the ritualistic manner in which we've listened to music since the birth of its reproducibility; there is a case for arguing that this highly portable event may then become part of such an

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<sup>119</sup> Benjamin, *Illuminations*, p. 217.

<sup>120</sup> Eisenberg, *The Recording Angel*, p. 41.

<sup>121</sup> *Ibid.*, p. 41.

<sup>122</sup> It is tempting to draw parallels between Attali's discussion of ritual within music (as a foreshadowing, sacrificial channelling of violence) and Benjamin's auratic ritual, even if these remain two independent ritual theses. Nevertheless, I feel their shared transition from ritual use to political and economic use (plus the ensuing re-ritualistic uses) is a noteworthy parallel.

associative ritual. Once portable, music becomes unavoidably utilitarian; the listener is free to employ this *Gebrauchsmusik* ('gebrauch' being German for 'use') in any manner he or she sees fit, as background music, music to motivate, soothe or invigorate, and so forth. Thus, *Gebrauchsmusik* or 'use-music' can be understood as music performing a utilitarian function. Strengthening the argument for re-ritualisation, Eisenberg clarifies: "As the critic Paul Rosenfeld noted some years later, *Gebrauch* can mean not only 'use', but also 'custom' or even 'ritual'."<sup>123</sup> "Anyone who owned a phonograph could use music for whatever he chose, in cheerful contempt for the composer's intentions, cultural conventions, and the sacred *Geist* or spirit of the music."<sup>124</sup> In this Benjaminian sense, Repeating is liberating and empowering.

What we bear witness to regarding such practices of re-ritualisation, is a dismantling of the rigid top-down prescriptive ritualising of traditional art and music, of religious institutions, concert halls, museums etc., in line with Benjamin's thesis. However, where Benjamin stops, we can continue with a further reconstructive, bottom-up, interpretive meaning-making that exists within the new prismatic modes of reception created by music recordings in Repeating. This active and complex re-ritualisation shows up the pessimistic, Adornian view of the iPod-jacked masses as passive consumers, as simplistic and inaccurate.

Adorno loathed the functional use of music within advertising and marketing, imbricated within the capitalist economy and deployed for commercial gain by, as he saw it, attempting to passively and unconsciously persuade us into purchasing goods (appealing to what he terms the 'commodity character' in us).<sup>125</sup> But as Simon Frith notes, "On the one hand, we primarily think of music in terms of its *use*; on the other hand, usefulness means *individual use*. ... it is equally important to note that people nowadays routinely use music to manipulate their moods and organize their activities *for themselves*."<sup>126</sup> The same influencing mechanisms as employed by marketeers can be self-induced as part of the personal rituals mentioned earlier, as part of what sociologist Tia DeNora calls emotional "self-regulation" and "self-modulation".<sup>127</sup> The range of music we can accommodate on our portable players allows us to tune our emotional circumstances as we see fit; rather than exist as passive respondents of the external functional use of music in Repeating, we display an active agency

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<sup>123</sup> Eisenberg, *The Recording Angel*, p. 39.

<sup>124</sup> *Ibid.*, p. 39.

<sup>125</sup> Adorno's view is not unusual given his conceit as a composer for wishing that his music be experienced as a pristine autonomous art, unmuddied by social function. While I can sympathise with this view, the pragmatics of modern musical reception and its broad functional spectrum demands that I reconsider.

<sup>126</sup> Frith, Simon, 'Music and Everyday Life', *The Cultural Study of Music* (New York, London: Routledge, 2003), p. 98.

<sup>127</sup> DeNora, Tia, *Music in Everyday Life* (Cambridge University Press, 2000), p. 53.

in how and why we choose to listen to the music we do. Susan Hallam writes, “The easy availability of music in everyday life is encouraging individuals to use music to optimise their sense of well being.”<sup>128</sup> Additionally, interest in the power of music as a therapeutic tool is growing following reports such as Hallam’s; music therapies are used to promote relaxation, improve children’s capacity for learning, and for increasing the quality of life of those beyond medical help.<sup>129</sup>

Whether listening to music to get us into the mood for going out with our friends, putting on background ambient music while we study, playing music while we do the washing up (or something similarly mundane), or turning music up to dance to cathartically, we are engaging in periodic private rituals that serve or enhance specific activities for our own ends.<sup>130</sup> In the case of mundane tasks (such as housework, cooking or driving to work), we can transform this activity from a necessary routine, into an engaging ritual, utilising music to elevate our emotional state while de-emphasising our involvement with the activity. A prime example of such a situation is illustrated by Lesley, a respondent of DeNora’s studies: “[Music] keeps you going – almost like nullifying in a way, because you don’t think about what you’re doing, you just listen to the music and get on with the routine of house-work or whatever.”<sup>131</sup> Another respondent, Nancy, describes her use of music as motivational: “First thing in the morning I quite like – sort of music that will get you up and get you going, so something that’s quite upbeat and cheerful. And late at night as well if I’m going out.”<sup>132</sup> We use music to feel in control, in command of these activities rather than passively at the behest of them, transmuting routine diversion into ritual act, in order to restore emotional comfort and balance that would otherwise be compromised.

Music’s increased portability and accessibility has exposed its functional malleability, even among private individuals; the diverse explosion of music’s use-value in contemporary society, resulting from dematerialisation, mirrors a similar broadening of the modes of reception. We now have evidence to dismantle the simplistic binarisms as proposed by Adorno used to describe modes of reception, such as ‘active’ or ‘passive’, thanks to the continued research into the quotidian use of music.

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<sup>128</sup> Hallam, Susan, cited in Frith, ‘Music and Everyday Life’, *The Cultural Study of Music*, p. 99.

<sup>129</sup> Most notably detailed by Bunt, Leslie, *Music Therapy: An Art Beyond Words* (Routledge, 1994).

<sup>130</sup> Much to the annoyance of Adorno, who would resent the dilution of ‘light’ music with profane activities of everyday life, along with the listening modes such activities engendered.

<sup>131</sup> DeNora, *Music in Everyday Life*, p. 55.

<sup>132</sup> *Ibid.*, p. 54.

### 2.3 Splitting Binarisms: Ubiquitous Listening

If I share Adorno's (and consequently Attali's) concern with the increasingly technocentric means of production and mediation of music from a musician's perspective, I do not share his condemning of the engendered modes of reception. While the music Adorno identifies as exhibiting his 'fetish character' is but a tiny subset of the musical landscape, he tars great swathes of music spanning countless genres and styles with the same brush; as DeNora notes, "the culture industry is too quickly written off as a monolithic force, its products dismissed a priori as undifferentiated, equally worthless."<sup>133</sup> While Adorno recognises that music and art should be analysed as a whole, both 'low' and 'high' art, it would seem that this same holistic approach focusing on commoditised music would prove less fruitful. Adorno overlooks the fragmented and variegated nature of the music industry, consisting of small 'cottage industry' independent labels, as well as larger independent labels, genre-specific labels, offshoots and sub-labels, whether operating in competition with one another, or under completely different *modi operandi*. In contrast to the increasing technical homogeneity of production, we witness a diverse subcultural landscape, again with some scenes and subcultures 'competing' against others, or operating independently, each displaying a further array of different listening modes and functions, as discussed earlier. In this light, Adorno's censure of music commoditisation, particularly regarding modes of listening, seems overly severe, as does Attali's subsequent pessimistic portrayal of Repeating.

In an attempt to update theories regarding modes of reception, such as Adorno's active/passive models, in light of the opportunities afforded by near ever-present access to music and its ensuing myriad functions, Anahid Kassabian has formulated a theory of 'ubiquitous listening'. Kassabian argues that music's ubiquity, whether through the prevalence of portable devices (either 'library' iPods or 'cloud' streaming network devices) or the increasing 'sourceless' use of music all around us in public (as part of advertising, in the background whilst we shop, have our hair cut, drink with our friends etc.) has necessitated an engendered mode of listening that is neither 'active' nor 'passive', but of a more flexible (arguably more forgiving) and practical nature.

The genesis of ubiquitous listening, according to Kassabian, builds on the passivity of 'muzak' or 'elevator music', as well as drawing from ambient music. Ambient music, as springing from Erik Satie's experiments with 'furniture music' and Brian Eno's 'discreet

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<sup>133</sup> DeNora, *After Adorno*, p. 28.

music’, prides itself in functioning as either background music or through active engagement; ideally, it will satisfy both listening modes. Kassabian continues:

But since the 1980s, ‘background music’ *has become* foreground music. According to the industry, ‘background music’ is what we colloquially call ‘elevator music’, and ‘foreground music’, which is most of contemporary programmed music, consists of works by original artists. While background music has all but disappeared, you can now hear everyone from Miriam Makeba to the Moody Blues to Madonna to Moby in one public setting or another—and quite possibly all of them at your local Starbucks.<sup>134</sup>

At this juncture, to pose as an Adornian devil’s advocate for a moment, we may argue that the increasing use of foreground music, in replacing what has traditionally been background ‘muzak’, is simply a symptom of an escalating and increasingly desperate means of attracting individuals’ attention—individuals who have become increasingly passive and numb to the incessancy of ubiquitous music in the econo-social sphere. It is a case of Benjamin’s habituation of distraction setting in as a result of the rising din. If widespread evidence for the use of similar modes of reception in more private and solitary environments did not exist (see Tia DeNora, as mentioned earlier, plus Christopher Small’s *Musicking*), then one might indeed be inclined to reach this conclusion.

However, as Kassabian remarks, “The development of recording technologies in the twentieth century disarticulated performance space and listening space. You can listen to opera in your bathtub and arena rock while riding the bus.”<sup>135</sup> Ubiquitous listening, as a mode employed during DeNora’s ‘self-regulation’, Small’s ‘musicking’ and the like, is a clear empowerment resulting directly from Repeating. This ‘ubiquitous subjectivity’, as Kassabian calls it, will no doubt feedback into and inform compositional practice, as a harbinger of shifts in modes of production, but whether it will truly yield anything resembling Attali’s Composing remains to be seen. The notion that modes of reception have been richly developed into a blooming variegation of corresponding social functions in both the private and public spheres, is difficult to deny. A similarly positive assessment regarding modes of production is presently far from conclusive; the spectre of Attali’s ‘crisis of proliferation’ would appear to loom far more threateningly for musicians than for listeners, despite the blurring of the distinction between them. Thus we are presented with a prismatic imbalance

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<sup>134</sup> Kassabian, Anahid, ‘Ubiquitous Listening and Networked Subjectivity’, *Echo* (vol. 3, no. 2), available at <[www.echo.ucla.edu/volume3-issue2/kassabian/index.html](http://www.echo.ucla.edu/volume3-issue2/kassabian/index.html)> (Accessed 20th September 2010).

<sup>135</sup> *Ibid.*

between modes of production and reception; the increasing technological homogeneity at one side of the prism, at the point of production, and the myriad facets of use-value on the opposite modes of reception. As we are still firmly entrenched within the capitalist machinery of Repeating, it is unclear how modes of production have been empowered by the technological ubiquity and increasing interconnectedness to the same degree as modes of reception.

### Chapter 3. The Democratisation of Discovery

Before we examine the issue of technology in musical modes of production over the next two chapters, let us first study the pragmatics of distributing one's music amidst our crowded online economy. One of the key aspects to the suggestion that we near, or have entered, an age of Composing, is the open availability of the necessary tools needed to create and disseminate one's music. Plenty has already been written about the potential of creating professional-sounding recordings from our increasingly affordable recording equipment and music software, given the experience and knowledge.<sup>136</sup> Parallel to this means of production, the internet now provides us with a second essential factor of democratisation, as an increasingly rapid conduit for dissemination. In his book, *The Long Tail*, Wired Magazine editor-in-chief, Chris Anderson notes this shift from "passive consumers to active producers", and continues: "You can see it all around you—the extent to which amateur blogs are sharing attention with mainstream media, small-time bands are releasing music online without a record label, and fellow consumers dominate online reviewing."<sup>137</sup> Developing the theme of empowerment, Anderson notes the thoughts of technologist author Doc Searls, who terms this shift from consumer to producer as "producerism", further echoing the spirit of Composing.<sup>138</sup> Philosopher and author Andrew Potter concurs, summing up this democratised movement succinctly: "What we are seeing now is the fulfilment of the old Romantic ideal of every individual as a creative spirit, as millions of amateurs flood the Internet with their own songs, videos, photographs and stories."<sup>139</sup> As we recall, an abundance of music creates a scarcity of attention; this 'attention' economy is therefore now predicated on the sale and availability of use-time rather than exchange-time.

As Potter intimates, it is clear that the resulting glut of creative output now fuelling some of the net's most popular sites such as MySpace and YouTube has led to the necessary

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<sup>136</sup> Paul Théberge's *Any Sound You Can Imagine* (1997) presents a comprehensive analysis of the democratisation of music production and its associated music technology consumption. The music technology industry and its multifarious publications, tutorial websites and news portals actively thrives on supplying us with low-cost, mass-produced music equipment, along with articles detailing how we can theoretically achieve 'professional' results. Mark Katz's *Capturing Sound* (2004) has also lucidly detailed how increasingly affordable music technology has allowed more people than ever before to dabble with their own home recordings.

<sup>137</sup> Anderson, Chris, *The Long Tail* (Random House, 2006), p. 63.

<sup>138</sup> *Ibid.*, p. 64. This term echoes futurist Alvin Toffler's term 'prosumerism' (1980), with which he predicted a merging of consumers and producers, as a result of an increasingly competitive and crowded marketplace.

<sup>139</sup> <[www2.macleans.ca/2009/07/13/when-%E2%80%98free%E2%80%99-becomes-really-expensive/](http://www2.macleans.ca/2009/07/13/when-%E2%80%98free%E2%80%99-becomes-really-expensive/)> (Accessed on 15th September 2010).

creation of a third democratising factor, that of filtering and recommendations.<sup>140</sup> Increasingly precise filtering and recommendation algorithms are necessary in order to negotiate the online music ecology accurately; the consumer reviews and recommendation methods, as used by retail giant Amazon, typical of the interactive ‘Web 2.0’, are of limited use. Such methods, being ‘reactive’ rather than ‘proactive’, risk simply reinforcing the convergence of consumer habits typical of ‘blockbuster’ economics, doing little to encourage the discovery of lesser-known artists.

Yet rather than accept a passive reliance on fan-driven models of discovery, independent artists are utilising increasingly novel and highly inventive means of attracting and receiving attention for their music. In direct acknowledgement and defiance of the post-audatic state of music, singer-songwriter Sufjan Stevens generated publicity for his means of imposing artificial scarcity on one of his songs. In 2007, Stevens decided that instead of releasing this song as part of a CD, he would trade it as part of a Christmas-themed competition.<sup>141</sup> Fans submitted their own songs for the venture, in the hope that Stevens would select a winner to receive the master rights to one of his own tracks, ‘The Lonely Man of Winter’. As the master rights holder, the winner would then be free to do what he or she pleased with the song, and in return, Steven’s record label (Asthmatic Kitty Records) would hold the rights to the winning entry song, which turned out to be a song by Brooklyn-based musician Alec Duffy.<sup>142</sup> In recognising the unique nature of the competition, as well as the press opportunities, Duffy chose to maintain this artificial scarcity by holding free private listening parties for Sufjan Stevens fans at his home; fans could arrange a time to visit Duffy, who would provide them with homemade cookies and drinks while they listened to Stevens’ song just once.<sup>143</sup>

Other promotional tactics employed by artists in the hope of raising attention to their music include not only the increasingly commonplace bundling of limited goods and collector items, but unique *activities*. A most notable and humorous example of such tactic comes from ex-Nine Inch Nails drummer, Josh Freese, who used a tiered model to sell his own 2009

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<sup>140</sup> Anderson, *The Long Tail*, p. 107.

<sup>141</sup> <<http://pitchfork.com/news/28102-sufjan-announces-christmas-song-exchange-contest/>> (Accessed on 16th September 2010).

<sup>142</sup> Duffy’s winning song can still be heard online at the Asthmatic Kitty site, <<http://xmas.asthmatickitty.com/index2.html>> (Accessed 16th September 2010).

<sup>143</sup> A blog post by one of Duffy’s visitors can be read online: <<http://journal.plasticmind.com/ears/the-lonely-man-of-winter/>> (Accessed 16th September 2010).

album Since 1972 (not quite a ‘freemium’ model, but very similar.<sup>145</sup>) The Guardian newspaper lists Freese’s ‘product’ list in full,<sup>146</sup> which in itself is a testament to the effectiveness of his novelty model in gaining press attention. Apart from the seven-dollar download format of his album, Freese offers additional limited packages such as a fifty-dollar double CD/DVD set that includes a phone call from Freese himself, up to a limited edition thousand-dollar option that includes signed drums and cymbals, CDs and a tee shirt, a dinner date, plus the option to “[g]et drunk and cut each other's hair in the parking lot of the Long Beach courthouse (filmed and posted on YouTube, of course).”<sup>147</sup> Freese’s top package, costing \$75,000, includes the usual assortment of CDs, DVDs and a tee shirt, but additionally allows you to tour with Freese, have him join your band for a month, take home one of his drum kits, plus numerous other activities. At present, his top package is still unsold, though he has sold numerous packages from the lower tiers (still with prices reaching five figures). In a desperate attention economy, novelty sells. However, a variety of models and strategies have been posited as means of negotiating such an economy from the perspectives of both production and reception, the most notable of which I will now discuss.

### 3.1 Plundering the Long Tail

In *The Long Tail*, Anderson unwittingly examines Attali’s philosophical idea of Composing from an economic perspective, pragmatically analysing the commercial effects and implications of this net-centric creativity boom. Although Attali envisaged Composing as existing outside of our current capitalist economy, it is undoubtedly difficult to imagine the full realisation of such a scenario on a scale exceeding its current fringe activity. The notion that an age of Composing acts as a musical presage to greater societal emancipation, for now remains a techno-romantic dream. Yet for computer musicians, composing within their home studios, the dream of turning fruitful hobbies into thriving careers is still a highly motivating factor, despite the unfavourable odds. Every week sees the arrival of ‘new music strategies’, on how best to capitalise on the opportunities provided by the decentralised online economy;

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<sup>145</sup> ‘Freemium’ models offer the base product (in the case of musicians, usually mp3s) for free, but offer additional, more expensive premium bundles for fans, such as limited vinyl, signed posters, home gigs and other artefacts and event/activities.

<sup>146</sup> <[www.guardian.co.uk/music/2009/feb/23/full-list-josh-freese-album-package-deals](http://www.guardian.co.uk/music/2009/feb/23/full-list-josh-freese-album-package-deals)> (Accessed 16th September 2010).

<sup>147</sup> Ibid.

how best to differentiate one's music from the myriad other musicians also vying for attention, far down the Long Tail.

Anderson suggests that this huge growth in so-called 'Pro-Am'<sup>148</sup> output, combined with the global dissemination potential of the internet, creates a huge market made up of thousands of individual niches. Given access to these niches through aggregators and online music retailers such as iTunes, to whom the traditional economics of scarcity and product inventory logistics simply do not apply, we have a potential market of millions of individual products, selling by small amounts on their own, yet combining to provide enough overall sales to make iTunes and the like an overwhelming financial success.

The Long Tail is a visual representation of product sales, ordered by decreasing sales units and plotted on a graph (creating a curve known statistically as a 'long tail distribution', according to Anderson). We have the handful of million-selling albums nestled together in an initial sales peak or 'head', which drops off sharply as the music gets more obscure, selling less and less. The important point to note about this is that the Long Tail is *extremely* long. Anderson stresses this point in the first chapter by illustrating this sales curve at various points along the tail.<sup>149</sup> The first example shows the number of track downloads via the US-only on-demand music streaming service, Rhapsody (subscription-based rather than track-by-track purchase-based), with the track limit set to equal that of a standard brick-and-mortar Wal-Mart inventory, of around twenty-five thousand tracks. What we are presented with is a clear power-law distribution curve. All these sales are part of The Head; these are the blockbusters that allow a brick-and-mortar retailer to survive. Given that physical product retailers need to populate a finite inventory, these are the products they decide to stock; a single CD takes up the same amount of space regardless of how many are sold, so the cost of 'rent' for an individual blockbuster per unit will be far less than a CD that sells just a dozen times per month. In short, traditional retailers' inventory is a zero-sum game, based on blockbuster economics.

Contrast this with download stores and it quickly becomes clear that these limits of finite stock inventory and storage disappear (or at least become so miniscule as to be meaningless). Consequently, download stores can hold a much greater amount of music in their inventory, providing the exact same music in the 'head' as Wal-Mart does, but

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<sup>148</sup> Anderson, *The Long Tail*, p. 60. Anderson's term used to describe the level playing field of professionals and amateurs.

<sup>149</sup> *Ibid.*, p. 19.

additionally reaching all the way down The Long Tail, to provide thousands of tracks that were previously economically unviable.

The inference here is that you do not need to be selling thousands of CDs each month to consider selling your music alongside those who might well sell that much. As touched upon earlier, the contention is less about access, and more of discovery. Filtering and recommendations currently fall short of providing the necessary means of digging in among the Long Tail products and linking purchases with those inside The Head, to draw consumers out beyond the territory held by top-ten charts and expensive ad campaigns. Instead of relying on traditional means of promotion and exposure, through magazine reviews, radio coverage and large advertising tie-ins, available only to larger record labels with the resources to bankroll such campaigns, burgeoning artists need to look elsewhere to help raise their profile. What we see evolving alongside the new Composers is a network of would-be taste mavens, challenging the existing media network by launching their own websites, starting blogs, contributing to online communities, reviewing and evangelising the work of new musicians—what we might call ‘the democratisation of discovery.’

Music blogs and music communities in general are essential resources to be mined when discovering new music; as a musician, I have found that locating and tapping into these communities is the first rung on the ladder in finding an audience for my music. Members of these communities are passionate enthusiasts, who live to discover and spread their musical discoveries to other enthusiasts, as online tastemakers who, in theory, will make or break new artists residing in the Long Tail. As our online music economy evolves from one predicated on the scarcity of goods to the scarcity of attention, mobilising as many fans to evangelise about one’s music is an obvious strategy.

We will certainly witness a rise in the complexity of algorithms used to guide listeners through search engines, or for purchase profiling, as well as monitoring the activity of listeners on huge communities such as MySpace and Facebook. These sites have a huge potential draw of music lovers, millions of potential listeners; actively attempting to accurately profile and make consequent recommendations will be huge undertaking, but necessary to be able to direct listeners to the smaller niches and artists with otherwise inconspicuous outposts on the internet. The large-scale user profiling from internet giants such as Google, MySpace, as well as retailers such as Netflix and Amazon, relies on

harvesting what James Surowiecki calls ‘the wisdom of the crowds’,<sup>150</sup> whereby the market is adjusted to suit the evolving tastes of consumers (and in our case, listeners).<sup>151</sup> Although this sounds very much like the kind of marketing and focus group-led activity we are accustomed to in our daily lives, in using this crowd ‘wisdom’, it is hoped we can achieve a more efficient method of finding information, music, and products ourselves as consumers and listeners rather than being passively subjected to marketing campaigns. Instead of relying on a small group of individuals to make choices for us about what we should listen to, it is hoped that we can be presented with the information necessary to find what we are looking for. According to Anderson, “these new tastemakers aren’t a super-elite of people cooler than us; they *are* us”<sup>152</sup>.

Last.fm is one of the more popular attempts so far to tailor new music to one’s tastes; using a small plug-in for your software music player, Last.fm will tally each track you play, noting the artists and tracks you play most, and update your account accordingly. Then using this data in co-ordination with other listeners of the same artists, it will attempt to fill in the blanks in your music tastes. If the service stopped here it would be unremarkable, and this aspect of the service obviously relies on other customers doing the groundwork to find new artists for you, but there is also a very powerful online component to Last.fm, built around a huge community with streaming access to a huge catalogue of music. This is where the service becomes more interesting.

If you want to take a more active approach to your musical discovery, you simply find your favourite artists on Last.fm’s site, where you will be given the option of selecting tracks to play from that artist. You will also be presented with a playlist of similar artists, and can select any artist you enjoy, to hear more from and read about, presented with a discography and statistics showing how popular each release is. If you do not enjoy a track within a playlist, you simply click on a button to ensure the recommendation system does not present similar tracks to this in the future. Conversely if you come across a track you love, then you can say so, to positively refine your recommendations. It is a similar idea to Amazon’s ‘customers who bought this also bought...’ system, only more highly nuanced and immediate.

Community is a very useful aspect of Last.fm; if you do not wish to search through track after track for something you like, you could try leaving a message on the artist’s page about the track you do like, asking other fans to offer suggestions. We all take pride in sharing

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<sup>150</sup> Surowiecki, James, *The Wisdom of the Crowds* (London: Abacus, 2005).

<sup>151</sup> Anderson, *The Long Tail*, 107.

<sup>152</sup> *Ibid.*, 107.

our knowledge with others; it is part of our human nature to contribute and feel valued—though some of us can be all too eager to share opinions or suggestions—so it makes sense to tap into this communal wisdom in case the algorithmic approach bears little fruit.

The last site I wish to mention, [thesixtyone.com](http://thesixtyone.com), is the most promising means of democratic discovery I have encountered so far, and a relative newcomer compared to Last.fm. On the face of it, [thesixtyone](http://thesixtyone.com) could be yet another social networking site, but is instead rather novel. By recognising hierarchical social music listening habits fashioned around respected tastemakers, and by incentivising listening within the site's community, you have a rich network of music fans eager to listen to new music. Granted, it provides charts of all the most popular artists in a particular genre, all the new submissions, the current movers and shakers, much like any other social music network site. But it also motivates listeners to get involved by creating a tiered, role-playing game-like levelling structure, whereby you complete a variety of tasks and challenges to increase your 'level' status, thereby increasing your standing within the community.

As a listener, your aim is to discover great new music before anyone else, and proceed to 'heart' it, bestowing your approval upon it. By carefully 'discovering' new music and 'hearting' it, you will then receive further points as other people listen to it, hopefully 'hearting' it too. Thus, your reputation of good musical taste increases. The earlier you can discover excellent, original, and prospectively successful music, the greater your chances of rising through the ranks, gaining points and eventually amassing subscribers (people who recognise and respect your musical taste). There are also extra challenges provided to supply you with bonus hearts to use, as well as unlocking features on the site such as direct access to individual genres, for instance.

I have not seen anything that works so effectively at incentivising listeners to discover music rather than simply listen to the top of the charts (and thus only sustain the chart-topper's hegemony) this successfully before; from first-hand experience, it really does manage to expose the majority of the music submitted. There is a much greater movement and fluidity to the music catalogued within such a system, as stronger currents reach down into the site's murky depths of the Long Tail, dredging up new music. The only criticism I can level at the site at the moment would be the classification of the music, as the genres tend to be rather hit and miss, relying on the artists to correctly classify the music, which seems unusual for a site relying so much on community action. Perhaps Last FM-style tagging should play a greater role in dividing music accurately into genres.

The bottom line with thesixtyone, is that it has understood two very important, yet simple, mechanisms that lie at the core of any online social dynamic, in order to motivate and incentivise listeners. Our feelings of importance, engendered through autonomous control over our actions within the site, shape its structure and affect how artists will be heard and developed by the community. In implementing its listener hierarchy, thesixtyone has very acutely acknowledged the value of what Sarah Thornton calls ‘subcultural capital’,<sup>153</sup> i.e. the good social standing and respect we accumulate through successfully illustrating astute judgement and good taste, and in doing so becoming the necessary taste-mavens to guide the less experienced listener towards good music.

### 3.2 The Human Touch

In his 2007 book “Net Blogs and Rock ‘n’ Roll,” David Jennings notes, using car reliability as an example, how we react to the immediate personal approach, giving weight to personal accounts as we respond empathically.<sup>154</sup> No matter how many glossy adverts, dry statistical surveys or consumer watchdog magazines we read, if someone personally spends half an hour recounting the difficulty spent trying to start their car, we will read negatively into that car manufacturer, despite this incident probably being in the vast minority. As we search for opinions about artists and albums to listen to, who should we listen to, and how do we assign value and importance to each of these recommendations? Are there some people we might listen to over others?

As Jennings notes, the best way to create a buzz among a community is by word-of-mouth, “especially if the buzz reaches a tipping point where it starts to spread under its own momentum.”<sup>155</sup> The epicentres of these buzzes are often the most ardent fans and followers within a particular genre or subculture, quick to notice developments from their favourite musicians. Jennings cites a breakdown of the types of music fan by Project Phoenix research, carried out by publishers Emap, splitting fans into four main categories, and further split into three or four subcategories.<sup>156</sup> This fan topology contains the whole spectra of music listener from the dedicated and informed ‘Savant’, through ‘Enthusiasts’ and ‘Casuals’, to the least

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<sup>153</sup> Sarah Thornton, *Club Cultures: Music, Media and Subcultural Capital* (Cambridge: Polity Press, 1995), available at <<https://pantherfile.uwm.edu/wash/www/102/thornton.pdf>>. Thornton’s term is a nod to Pierre Bourdieu’s ‘cultural capital’, part of a framework describing power relations and social dynamics.

<sup>154</sup> David Jennings, *Net, Blogs and Rock ‘n’ Roll* (London, Boston: Nicholas Brealey Publishing, 2007), p. 146.

<sup>155</sup> *Ibid.*, p. 18.

<sup>156</sup> *Ibid.*, p. 31.

interested group, the ‘Indifferents’. It is these Savants and Enthusiasts at the core of any online community or music blog that will be the most active and vocal, consuming, sharing, and often making new music themselves. These are the tastemakers that will either embrace or snub new artists tentatively securing a footing within their young music career. Consequently, new Long Tail artists need to seek out these communities, integrate, communicate and co-operate with them, to stand the best chance at cementing a small core following, whose knowledge and enthusiasm for their particular music niche will act as a catalyst for spreading awareness about these artist up through the Tail. Why do the Savants do this—what incentive do they have for supporting and spreading the word about new artists? Reputation and respect within their community is one factor; these are music lovers who spend much of their waking life consuming and researching music, and relish the opportunity to exercise their seasoned opinions. Jennings suggests a competitive spirit within Savants’ social circles, an element of one-upmanship, with Savants competing to break news about new artists before each other, and so distinguishing themselves among their peers.<sup>157</sup> However, this behaviour has led to criticism from those outside the scene or subculture, labelling individuals displaying this potentially snobbish or elitist attitude as ‘hipsters’, who care more for appearing distinguished than about enjoying the music itself. Certain music blogs and zines have consequently been subject to the occasional light-hearted jibe, such as Pitchfork Media, which was amusingly subject to an article in the long-standing satirical website, The Onion, running a piece in which Pitchfork gave music itself a rating of a six-point-eight out of ten.<sup>158</sup>

Online communities are still subject to the same subcultural styles and argotic memes of online representation as they are offline, and although somewhat abstracted over the internet, the primary reasons for communal gathering and interaction are much the same. We still see fans eager to differentiate themselves and validate their contributions by posting something unique and ahead of the curve (they will certainly be swiftly notified if something they have posted is ‘old’ news, usually by community members with a higher standing (or post count). Contributors (usually Savants) are keen to develop their ‘subcultural capital’, to enhance their image among their peers and establish their growing authority within the community (and “to form the vanguard of taste and set the pace of innovation”).<sup>160</sup> This is an ongoing balancing act between shared tastes and ideologies and the kind of one-upmanship I

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<sup>157</sup> Jennings, *Net, Blogs and Rock ‘n’ Roll*, p. 34.

<sup>158</sup> <[www.theonion.com/content/news/pitchfork\\_gives\\_music\\_6\\_8](http://www.theonion.com/content/news/pitchfork_gives_music_6_8)> (Accessed 14th September 2010).

<sup>160</sup> Jennings, *Net, Blogs and Rock ‘n’ Roll*, p. 227.

described earlier, with one's subcultural capital enhanced by not only the knowledge of new artists but the collection of artefacts about these new artists (such as 'limited' editions, white label twelve-inches and the like, attempting to re-inject Benjaminian 'aura' back into the artefact).

### **3.3 One Thousand True Fans**

Given we can now distribute our music easily over the internet, and that measures exist to assist in the discovery of our music within the Long Tail (measures that are constantly evolving and improving), how do artists earn a living? If so many of us are producing, remixing and rehashing each other's music and video, is it still feasible to expect to be able to find an audience large enough to sustain ourselves on a full-time basis, without the traditional support network of a record label? The Long Tail is clearly a blessing for the aggregators—the iTunes and Amazons, YouTubes and Last.fms of the world—and all those who enjoy the use of these websites and services. Yet I cannot help but perceive a growing frustration among the artistic community, watching all these companies amass millions of hopeful musicians, each hoping to find their audience yet struggling to make themselves heard among an increasing din.

One of the more popular recent theories proposed to realise the utopian notion of making a living disseminating music via our own decentralised home studios, was Kevin Kelly's 'One Thousand True Fans.'<sup>161</sup> In a nutshell, Kelly posits that if we can find just one thousand fans willing to part with a hundred dollars each year for the fruits of our artistic endeavours (through music sales, gigs and merchandise etc.), then we can call ourselves professional musicians/artists/directors and forget about the day job. These numbers are not meant to be taken as a definitive rule, but suggest an ethos of gathering a group of dedicated fans and producing something a little more unique than a mass-produced CD; more of a desirable boutique approach such as hand-signed album sleeves, multitrack DVDs for fan remixing, large-format limited artwork prints etc. Again, this suggests reviving a work's auratic character, to return value to a work currently in danger of being viewed as disposable, or at least as a basic utility. Ideally, these True Fans would each be a Savant, someone with the motivation to create hype and excitement around artists, in turn creating so-called 'Lesser Fans'.

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<sup>161</sup> <[www.kk.org/thetechnium/archives/2008/03/1000\\_true\\_fans.php](http://www.kk.org/thetechnium/archives/2008/03/1000_true_fans.php)> (Accessed 14th September 2010).

It sounds so simple, so tantalisingly feasible, which is undoubtedly the attraction of a number like a thousand, being easily conceivable and apparently attainable. Instead of aiming for The Head of the Long Tail and failing, attempting to create top-ten blockbusters, we should instead concentrate on gradually gaining our True Fans. I would like to believe this approach would work, but I have difficulty believing in the balancing act of constant fan interaction, producing enough music to fulfil such a relationship to keep my True Fans' attention from waning (as artists compete for their prospective fans' attention), and wearing the umpteen different hats necessary to keep such an enterprise afloat.

In recognising that his theory had little in the way of case studies to back it up, Kelly has since been trying to track down artists who have successfully subsisted on such a model. The Thousand True Fans as a premise is not wholly innovative, as independent record labels and artists have been following a similar blueprint whether they consciously realised or not, but it has undoubtedly struck a chord within the artistic community, such is its simplicity and succinctness. One artist who replied to Kelly, offering some grounded feedback, was ambient musician Robert Rich.<sup>162</sup>

Rich has been writing and selling his own music since the early eighties, and admits that he is still able to do so today due to the small fan base he built up before the existence of the internet, albeit with supplementary income streams from mastering and engineering other artists' music. Although Rich agrees with Kelly's core thesis, he raises some salient points that do not entirely mesh with the premise.

In your article you quote the term 'microcelebrities' which rings ironically true to me. I suppose I experience a bit of that, when some of the 600 people whom I see on tour come up to me after a show and tell me that my music is very important to them, that it saved their life, that they can't imagine why I'm not performing in posh 3,000 seat theatres rather than this art gallery or that planetarium or library.

In reality the life of a 'microcelebrity' resembles more the fate of Sisyphus, whose boulder rolls back down the mountain every time he reaches the summit. After every tour I feel exhausted but empowered by the thought that a few people really care a lot about this music. Yet, a few months later all is quiet again and CD/download sales slow down again. If I take the time to concentrate for a year on what I hope to be a breakthrough album, that time of silence widens out into a gaping hole and interest seems to fade. When I finally do release something that I feel to be a bold new direction, I manage only to sell it to the same 1,000 True

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<sup>162</sup> <<http://robertrich.com/1000-true-fans-an-answer/>> (Accessed 14th September 2010).

Fans. The boulder sits back at the bottom of the mountain and it's time to start rolling it up again.<sup>163</sup>

Rich's down-to-earth tempering of Kelly's optimism, reminiscent of Friedrich Engels's remarks concerning the Sisyphean nature of labour,<sup>164</sup> is a valid criticism of the model. The critical mass of fans created by a mass-produced CD, necessary for a reliable income, does not exist. You need to be continually creating and touring to create any interest in your music, as once you stop working, the interest will wane almost immediately; there is no room for failure, with no contingency. Moreover, while you return to the studio to record the next album, you are living on the remnants of the last album and tour income, with no guarantee that you will create revenue from the next album. You will be working, but, as this is a gamble rather than a wage, you will be barely earning.

In an age where the value of recorded music continues to plummet, whereby we need to return to the handcrafted artisanal approach to music production, creating auratic artworks, we need to create products with a perceived value above that of mass-produced CDs and limitless music downloads. Consequently, given that these products will be more expensive to produce, at a price that only our True Fans will be willing to pay, we risk pandering to our precious core audience as the main means of income. Will their attention wander if we stray too far from our established style, confounding their expectations? The constant attention required to keep lines of communication open between artist and fans, to sustain interest in an attention-starved 'global village', surely risks fragmenting the contemplation and focus at the core of the musical process. The growing weight of the risks involved in taking weeks out to concentrate on one's music without interruption becomes difficult to bear and justify; will your True Fans wait for you?

Rich draws a parallel to the True Fans model with evolutionary biology, whereby limiting the gene pool causes a greater risk of extinction from disease or environmental change. Relying on a committed small core group of listeners could be viewed as similar to an animal relying on a single food source for survival; it is a fragile existence at best.

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<sup>163</sup> <<http://robertrich.com/1000-true-fans-an-answer/>> (Accessed 14th September 2010).

<sup>164</sup> "The miserable routine of endless drudgery and toil in which the same mechanical process is gone through over and over again, is like the labour of Sisyphus. The burden of labour, like the rock, keeps ever falling back on the worn-out labourer." Engels, Friedrich, cited in Marx, Karl, *Capital: A Critique of Political Economy* vol. 1, part 1, 'The Process of Capitalist Production' (New York: Cosimo Books, 2007), p. 462. Though it would be somewhat crass to suggest the factory machinist and the studio musician share this same magnitude of Sisyphean fate, there are undoubtedly parallels involved in the technical anchoring of their labour to their machines and computers.

Of course, this all assumes that one has found one's True Fans. We have not even begun to discuss how long it might take to accrue them, or how widely we need to cast our nets to find them. If we need to reach a thousand listeners, or even a hundred, to secure a single True Fan, then it will take quite some time. For those who have already found their True Fans through old modes of promotion and distribution, capitalising on these new modes of distribution and business models certainly has the potential to be hugely profitable. Two such artists that have hit the headlines with their recent approaches to distribution during the past six months are Radiohead and Nine Inch Nails—both huge bands borne of the traditional recording industry, taking advantages of their respective recording contract expirations to experiment with new methods of selling directly to fans.

Radiohead decided to release their last record online in mp3 format, allowing fans to pay whatever they felt suitable to download the release, including nothing at all. The revolution had started, or at least many glibly declared something along such lines, apparently sounding the death knell of the music industry. This so-called revolution lasted for as long it took for Radiohead to announce traditional CD sales of the album through XL Recordings, an independent but nonetheless sizable record label.

The main issue with Radiohead's model was the encoding quality of the music itself. Many fans, including myself, gave Radiohead the benefit of the doubt when paying for their music a couple of weeks in advance, despite having no idea about the quality of the music we would receive, as Radiohead decided not to disclose the mp3 encoding rate. It was not until the release date that we finally learned of the encoding rate: 160kbps—somewhat low on the quality scale given today's prevalence of 320kbps encodings and even lossless CD-quality downloads. Many felt, justifiably in my opinion, a little cheated to have paid for something so disposable. Of course, what we had in effect done was pay for the otherwise usual 'leak' that inevitably occurs when promotional copies of album go out to the press and end up on the file-sharing networks. Radiohead had managed to turn the exercise into a canny promotional campaign, while pocketing some extra cash and being hailed as internet pioneers at the same time, before announcing the traditional CD release strategy with a large independent record label. In many fellow musicians' eyes, they had effectively devalued music downloads by displaying a laissez-faire attitude towards pricing downloads, lacking a price stipulated to

reflect the album's value, and instead capitalised on the press furore to promote the more conventional physical editions of their album.<sup>165</sup>

However, in addition to their download and standard CD editions, Radiohead interestingly decided to take a more boutique approach by offering a 'discbox' containing, as well as the CD, a double vinyl edition, a second CD containing additional unreleased tracks, a lyric booklet and stickers, packaged in a hardcover book and slipcase, for £40. This appears to espouse the kind of True Fan marketing ideology encouraged by Kelly, only on a much larger scale. Although no sales figures were officially released, an interview in the Observer suggested between sixty and eighty thousand copies of the discbox were sold;<sup>166</sup> True Fans that were no doubt attained through years of touring, marketing and promotion at the hands of the 'old' music industry.

In a similar move, Trent Reznor of Nine Inch Nails, free from the shackles of his recording contract with Interscope Records, tried a similar experiment. Critical of Radiohead's model,<sup>167</sup> Reznor sought to make a few amendments with his own attempt at a multi-faceted direct-to-fans internet release. Offering thirty-six tracks, downloadable in a variety of high-quality formats for five dollars (including lossless FLAC, Apple Lossless, as well as 320kbps mp3), it certainly felt like a much better deal than Radiohead's offering. Upping the ante in the product variation stakes, Reznor offered an array of physical product options, culminating in the 'Ultra-Deluxe Limited Edition' box set consisting of CDs, DVDs, multitrack recordings, Blu-Ray discs, art prints and hand-numbered with Reznor's autograph, for three hundred dollars. Still, given this high price, Reznor clearly had enough True Fans to sell out of all two and a half thousand units of this edition almost instantly, grossing \$750,000.

For the artists who have benefited from years of sustained promotion and marketing clout, it is clear the options open to them now they already have their fan base provide many benefits, offering a freedom and potential for remuneration that young independent artists can only dream of at the moment. It remains to be seen whether Kelly's thesis will ring true for artists just beginning their career in the file-sharing internet age. Only then might we dare to suggest that Attali's age of Composing has finally dawned; until then, everyone may be

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<sup>165</sup> See:

<<http://arstechnica.com/old/content/2008/03/reznor-says-radiohead-offering-insincere-industry-inept.ars>>

<[www.wired.com/underwire/2009/06/sonic-youth-slams-radioheads-in-rainbows-model/](http://www.wired.com/underwire/2009/06/sonic-youth-slams-radioheads-in-rainbows-model/)>

<<http://news.bbc.co.uk/1/hi/entertainment/7445777.stm>> (All accessed 14th September 2010).

<sup>166</sup> <<http://music.guardian.co.uk/omm/story/0,,2222276,00.html>> (Accessed 14th September 2010).

<sup>167</sup> <[www.abc.net.au/triplej/hack/notes/s2185560.htm](http://www.abc.net.au/triplej/hack/notes/s2185560.htm)> (Accessed 14th September 2010).

composing, but struggling to be heard amidst the noise. It is becoming increasingly evident that within the online 'attention' economy, music alone is insufficient; artists need to reintroduce an aspect of uniqueness to their work, as part of the process, the product and its promotion, to find a voice. I will therefore spend the next chapter examining how I can start this process of reintroducing auratic value and meaning to my work.

## **Practical Rematerialisation (Part A): Auratic Restoration**

In explicating my wishes to rematerialise my music and practice, I draw heavily from the preceding chapters, most notably in addressing what Benjamin famously observed as a withering of an artwork's 'aura' in line with its mass-reproduction, concurrent with the removal of its ritual use-value. While I disagreed that the ritual use-value of dematerialised music disappears in tandem with its aura, the likelihood that an mp3 file will exhibit auratic characteristics will be less likely than even a mass-produced compact disc. Consisting of pure use-value, zero exchange-value, existing at the very limits of ephemerality as binary data, music in such a state of storage has become as homogenised as any other computer file, undermining its value before it has a chance to defend itself (by being played). In the marketplace, as a file for purchase on Apple's iTunes store, music exemplifies a state of hypercommodification; yet through this accessibility and portability, 'ubiquitous music' achieves an alternative means of individual re-ritualising through its quotidian use, allowing listeners to create and refashion their own rituals, despite its post-auratic character. In this respect, I argued that dematerialised music has catalysed an emancipation for listeners; the modes of reception have gained immensely, albeit evincing a decidedly consumerist tint to an age of Attalian neo-Composing.

As a studio composer, I wish for the modes of production to be similarly leveraged by dematerialisation, yet witness the opposite occurring. As hopes for a workable online meritocracy or 'reputocracy' wane, the pervasive offline economics of scarcity continue to inform the mindset of the online economy, curbing movement towards an alternative working model of artistic remuneration. As such, the methods involved in rematerialising my practise, specific to modes of production, will illustrate my journey from dematerialised mp3s to more unique auratic artefacts.

### **A.1 *Death of an Aura* (download EP)**

### **A.2 *Like Dust of the Balance* (CD album) [ref. included media]**

Originally completed in 2007, and released during the following year, the *Death of an Aura* EP represented the motivational inception towards rematerialising my practice. Initially released as a download-only EP, it provided the core material for my subsequent 2009 album, *Like Dust of the Balance*. Both releases feature a long-distance collaboration with guest instrumentalist, Benet Walsh, who emailed me during late 2006, expressing an interest in

working together. We initially wrote two tracks that would end up on the EP (namely, 'Napoli' and 'Raido'), in addition to four of my own tracks. Following our fruitful work on the EP together, Benet and I worked on a further two tracks ('Dustlands' and 'A Great Wave') that would end up on the album, alongside five of the six tracks from the EP. The only track from *Death of an Aura* not also feature on the album was 'Threnodie' [ref. included media: CDR track 1].

On reflection, following completion of the album, I was able to identify a fluidity in my composition practice, specific to the collaborative tracks. Benet recorded his instrumental parts in his own home studio, before bouncing down a series of multitrack audio files, burning them to CD and finally posting them on to me. Once received, I imported the audio files into my own sequencing software, and proceeded to flesh out his stark arrangements with various synthesised accompaniments and home-sampled sounds. I realised that working with an existing framework, around which I could develop with my own compositional elements, was instrumental in quickly and fluidly creating music, without having to formulate an initial approach from scratch.

Using this delegable and collaborative approach, with one party providing the compositional seed while the other completes the piece, created an optimised balance between creative and technical modes of engagement (which catalysed my research for the remaining half of this thesis). Benet recorded the raw instrumental tracks, doing little more than simply setting up a microphone and hitting record, allowing him to focus and engage with his performative creativity. Meanwhile, I could continue working in a more technical capacity with my production software, padding out the music with extra production elements as well as handling the overall mixing and engineering. Of course, these two different roles, a creative composer and a technical recording/mixing engineer, were traditionally assumed by two different people. Having to switch between these conflicting modes of engagement comes with the territory of being a solitary computer musician, yet it is a subject often overlooked when assessing the emancipatory or democratising effects of technology. I found it more liberating to focus solely on the technical requirements of the music, unfettered by a nebulous compositional process, precisely due to the inherent technical bias of computer software (a subject I will consequently explore over the next two chapters).

For the remaining, non-collaborative tracks, I experimented with a more structurally relaxed approach to composition in an effort to rejuvenate my practice, as well as attempting a more immediate means of injecting my own personality into my practice via the use of vocals. I had become somewhat jaded with my prior approach of a more technically-rigid, idiomatic

composition style, which was still heavily affected by the initial stylistic framework that informed my earlier work (i.e. heavily influenced by Warp Records' roster), and wished to reclaim some of the software-borne sounds and timbres.

I found singing on some of these tracks immensely satisfying, due to the intuitive immediacy it affords. On 'Whispers', I recorded a few takes of vocals, the lyrics being largely impromptu and unintelligible, acting more as tonal ornamentation than pop verse. Even so, I feel the unmistakable sound of vocals on a piece of music added a certain depth of quality and personality that no amount of synthesis or sample-sculpting would achieve, enriching the clinical sterility of synthesis and pattern-based quantisation. As a direct means of referencing embodied sound, singing requires a creative mode of engagement, outside the graphocentric technical mode of engagement typically employed during computer use (which places primacy on the mind and the visual, over the body); as such, it represents a first step towards reviving these atrophied modes of creative engagement (I will explore and discuss these different 'modes of engagement' in the course of the following chapters). Just as Benjamin notes within 'The Storyteller', "traces of the storyteller cling to the story the way the handprints of the potter cling to the clay vessel",<sup>168</sup> I try to leave a trace of myself—my voice—in the music.

Although 'Whispers' features the most overt use of my voice, I also added to 'Napoli'/'Napolese' as a background vocal pad, bedded within the strings. Incidentally, I renamed the version that appears on 'Like Dust', as it contains a slightly different plucked lead recording, as well as a tweaked mix balance. In retrospect, I wish I had refrained from doing this, as it seems a ludicrous reason for re-titling the track, but it illustrates the temptation I felt to tweak the track even though it was already released as a download. To me this track simply did not feel complete; I could not move on to the next track. I put this inconclusiveness down to knowing that I could simply replace the previous online version if necessary; the impermanent flux of the online economy is thus both its strength and weakness. For collaborative projects with many contributors, the fragmentary and inherently incomplete and extensible nature of the web is a blessing, but as a musician looking to complete a project and move on, the endless opportunity for tweaking is a curse. In the end, Benet suggested we rename the new mix I had created, and finally halt work on it.

Other tracks feature my vocal ornamentation, including 'Dustlands', which contains a heavily effected 'ooh' vocal melody line. The track represented a particularly successful

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<sup>168</sup> Benjamin, 'The Storyteller', *Illuminations*, p. 91.

departure from my usual structural working practice, based on more of a drone foundation of repetition and harmonic stasis, due to the tuned percussion. This abstract narrative of ‘grounding’ repetition is exemplified by the interwoven percussion loops (provided by Benet, and augmented by myself, with electronic beats). This foundation also provided an opportunity to play against its stability; the coda of the track sees the steady rhythms drop away, while the vocal melody line remains, this time joined by an animated counterpoint of orchestral strings.

‘Dustlands’ also constitutes a concerted effort to move away from the kind of ‘discursive’ repetition that characterised my previous output, relating, as it did, to a pop format of different overarching sections. Instead, focusing on a more gradual building of ‘musematic’ repetition, I have attempted to create a more emergent track development, included the measured addition of layers, to create a narrative arc without the use of discursive building blocks.<sup>169</sup>

‘A Great Wave’, another of the collaborative tracks, also features such an emergent song structure, albeit of a more sprawling and less nuanced nature to ‘Dustlands’; the track progresses through a series of different keys, time signatures and timbres, ending in a completely different place to where it began. I took the opportunity to challenge the feel of the elements that Benet had recorded, which were particularly well-formed, establishing a clear atmosphere, and tried to take the track in an unrelated direction, with mixed results.

Where discursive building blocks do appear, such as on ‘Raido’, the stripped-down Hang-drum-based ‘Hang Garden’, or ‘Pteron’, I have attempted to ensure each discursive repetition is altered slightly, with either musematic variation, or with additional instrumental layers. The result is a more circuitous song structure compared to ‘Dustlands’, akin to more of a traditional pop e.g. ABABCAB structure.

Whether composing on my own or collaboratively with Benet, I have attempted to reclaim a certain amount of bodily agency from my software, attempting to impart a more indelible sense of my character in my music, through the addition of instrumental recordings and singing. Yet still, the end product I create as a result of these actions feels somewhat anonymous, whether as a CD, or as is increasingly the case, dematerialised mp3 files. A

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<sup>169</sup> Middleton details the difference between musematic and discursive repetition thus: “Musematic repetition is, of course, the repetition of musemes [i.e. a basic unit of musical expression, coined by Philip Tagg, 1979]; the most immediately familiar examples—riffs—are found in Afro-American musics and in rock. Discursive repetition is the repetition of longer units, at the level of the phrase, the sentence or even the complete section.” *Studying Popular Music*, p. 269.

certain level of agency may have been reclaimed in the process, but the end result of these processes had arguably not significantly changed. Therefore the next logical step following the rematerialisation of my practice entailed the creation of something more unique than a collection of music files.

### A.3 The *Auratic Artefacts* Series [ref. included media: CDR tracks 3-5, DVD title 1]

Although I felt I had achieved, in some respects, an improvement in my working musical practice, I nevertheless desired to balance this with a corresponding rematerialisation for my musical output. Rather than settle for a CD or online dematerialised representations of my music, I sought to reinstate an element of auratic uniqueness to my finished works. Given my research on Benjamin and Adorno, plus my assessment of the crowded online ‘attention’ economy, I finally decided to research the possibility of creating a set of three playable one-off vinyl records, laser-etched with a full side of colour artwork, which I would title the *Auratic Artefacts* series (Figure 2, Figure 3 and Figure 4). I would simply designate each disc with a Greek letter, with a view to continuing with the series as I produced more music, so we began the series with three discs: ‘Alpha’, ‘Beta’ and ‘Gamma’ (this also meant we could start work on designing the discs ahead of the music being written and titled).

Regarding the choice of recording medium, I decided on the twelve-inch record format as a balance between accessibility, practicality and uniqueness; the format is still moderately popular, especially among enthusiasts, and therefore retains a high element of playability. It also presents a large working canvas for eye-catching designs, and as an object, it is an inherently tangible and tactile slab of transcriptions. More importantly, as discussed by Adorno and Eisenberg, it is a means of permanence, a scriptal spiral of audio, that can outlast



*Figure 1. The Auratic Artefacts emblem (pertaining here to the ‘Alpha’ disc).*

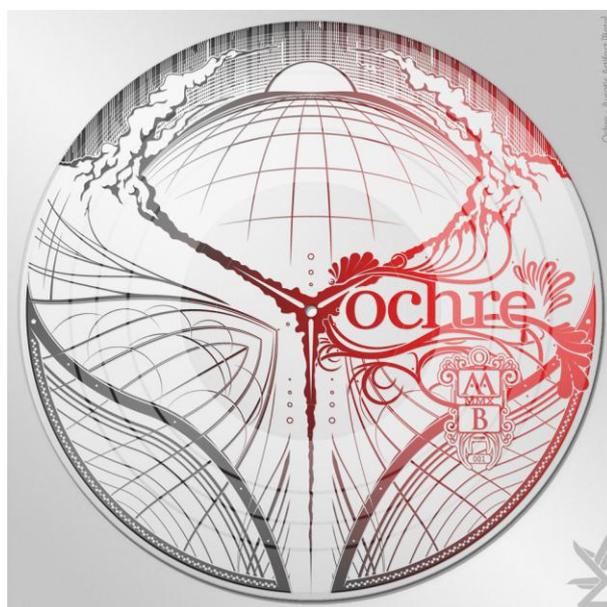


*Figure 2. The design for Alpha.*

more technologically-dependent digital media. The audio, as a series of vibrations of varying frequencies, is directly ‘transcribed’ onto the vinyl substrate, requiring just a needle and a sympathetic resonator to reproduce; in an age of digital corruption, read/write errors, the panoply of codecs and file formats, I find this profoundly reassuring. The modern vinyl record is also at an advantage in how it responds to physical wear and tear; when the surface is scratched, the audio quality suffers, yet such degradation occurs gracefully. Instead of simply being rendered unplayable, as a compact disc might be once scratches become so deep that the CD player’s error-correction circuits cannot fathom, the record will instead develop an audible patina of surface noise, crackle and groove-skipping. Returning to Benjamin, such a patina serves to remind us of another auratic indicator, defined as the artefact’s “presence in time and space, its unique existence at the place where it happened to be.”<sup>170</sup> Consequently, each time the record is played back will result in a slightly different performance.<sup>171</sup>

But as I was to discover, the logistics of creating such an artefact would prove to be somewhat of a challenge. Although I luckily managed to call upon a designer friend, Nathaniel Reeves, who kindly agreed to handle the design aspect of the vinyl set, we then had to figure out whether laser-etching was feasible, where it was available, and how to create a single vinyl record that remained suitably durable.

After scouring the net for information, I learned about a more recent means of creating a ‘dubplate’,<sup>172</sup> i.e. a one-off record typically used by DJs to play unreleased underground tracks during their sets. These plates were traditionally known as ‘acetates’ or ‘lacquers’, as they were created by



**Figure 3.** *The design for Beta.*

<sup>170</sup> Benjamin, ‘Work of Art’, *Illuminations*, p. 214.

<sup>171</sup> Artist Christian Marclay most notably explored the patination of vinyl records with his 1985 ‘Record Without a Cover’ project. Marclay released fifty single-sided 12” records without protective sleeves of any kind, highlighting how the physical wear of the record becomes an integral part of it: “Record Without A Cover was about allowing the medium to come through ... making a record that was not a document of a performance but a record that could change with time, and would be different from one copy to the next.” <[www.guardian.co.uk/music/2005/feb/14/popandrock](http://www.guardian.co.uk/music/2005/feb/14/popandrock)> (Accessed 21st September 2010).

<sup>172</sup> The term ‘dubbing’ comes from ‘doubling’, meaning to record and replicate, and so a dubplate is a duplicate recording (albeit usually from a digital source).

coating an aluminium disc with a thin layer of nitrocellulose lacquer, soft enough to be recorded onto by a record cutting lathe.<sup>173</sup> This reference disc could then be used to create a master disc for high-volume record pressing, or be played by DJs. However, the softness of the lacquer discs meant longevity was extremely limited; each time a lacquer disc is played, the stylus will subject the disc surface to a certain amount of wear, so lacquer dubplates do not typically have a useful lifespan of more than about fifty plays. For my purposes, this was therefore a problem, given my need of a permanent artefact.

More recently, a process has been developed that allows mastering engineers to cut directly onto blank discs more similar in material to commercially-produced records, typically made of polyvinyl chloride (PVC) or polycarbonate. The main advantage of such a material is hugely increased longevity, lasting practically as long as pressed vinyl, and so was a perfect choice for my needs. The downsides to such a material was the increased difficulty in cutting to such discs, and different mastering engineers favoured slightly different



*Figure 4. The design for Gamma.*

methods, often with custom-made or heavily modified lathes, and would only cut to a particular material. Typically, cutting would be achieved by raising the temperature of the disc before cutting to about forty degrees Celsius, as well as using a heated diamond stylus in the cutting lathe to further assist in a deep, pronounced cut (resulting in a healthy playback loudness). The problem created by such a varying working practice between studios (given this is very much a non-standardised, niche practice), was being tied to using the source material (the vinyl ‘blanks’) used by the studio that would carry out the final cut.

In the end, I decided to use a London-based studio, and so shortly before Christmas 2009, I procured a set of transparent blanks from the studio, including a spare blank for each prospective design, so that we could work on the art, colouring and laser-etching our blanks, before returning them to the cutting studio to have the audio cut. With our cutting studio established, Nate, my designer, set about contacting a laser-etching facility that might be

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<sup>173</sup> <[www.madonnacatalog.com/guides/acetate.htm](http://www.madonnacatalog.com/guides/acetate.htm)> (Accessed 18th September 2010).

amenable to our needs. As Nate is based in San Diego, we decided that using a local stateside facility, while lengthening the production schedule, meant that he could discuss the practicalities of etching his designs in person, able to sort out any design problems quickly, as well as being better able to document the process.

In the meantime, I was still busy completing the music that would end up on these discs. I arbitrarily designated ‘Awaiting the Green Morning’ as Alpha, ‘David Elsewhere’ for Beta, and ‘Jack In’ for Gamma, and sent rough demos of these tracks to Nate to provide him with some design inspiration. After I had completed the mixing, and Nate had created the bespoke designs for each disc, I organised the audio mastering by an engineer based in Seattle, before preparing the dubplates for their cutting in London.

### *A.3.1 Laser-Etched Dubplates*

As we decided to use transparent blanks, I envisaged the final artefact as having a playable side cut with audio, with the coloured disc designs on the blank side of the vinyl, thus being visible from the playable side. In order to achieve this, we would first need to apply our colour to the blank design side of the disc, before etching through it with the laser. Areas etched with the laser would thereby remove the paint, resulting in transparent areas in accordance with the black areas in our designs (Figure 5). This meant trying out a selection of paints on some cheap acrylic plastic, to see which paint was easiest to etch cleanly. Pleased with the results, we decided to proceed with painting the PVC blanks, until they were fully cured and ready for etching.



*Figure 5. The raw design as sent to the laser-etching machine. Black areas are etched, white areas are skipped.*

The differences between the acrylic and the polyvinyl became apparent as soon as we were a quarter-way through etching the first blank. With the laser set at 10% strength as before, it was etching cleanly through the paint, yet began scorching the PVC surface. Consequently, the edges of the design started to bow upwards due to the heat created. While we expected the PVC to react a little differently to the test acrylic, we were unprepared with just how heat-reactive it was by comparison. The heat produced by the laser was absorbed by the face of the PVC, curling up and then cooling, destroying the definition of the etch and

blurring the intricate designs. Moreover, the laser was causing the PVC to catch fire slightly, charring the inner faces of the etched areas. With this first blank ruined, we had a further two opportunities to refine the procedure before eating into our final three blanks.

Turning the power of the laser down to minimum, and increasing the etching speed ended up being the best course of action; this meant that each pass of the laser etched by very small amounts, thus requiring repeated passes (ten in total for each disc), but it seemed to help keep the scorching to a minimum. This approach, as it turned out, created new problems with the type of paint used on one of the discs. The paints used for 'Alpha' and 'Beta' (green and yellow; black and red) were of a high-heat formulation, meaning they would etch cleanly without melting or igniting. The paints for 'Gamma', however, as different colours (blue and taupe), were not of this same formulation, instead resulting in a rather hard and glossy enamel-style finish, which the laser could not etch through on the low power necessary for the PVC (although of course, it worked perfectly on the test acrylic, etched at a high laser power). Nate was forced to strip the paint from 'Gamma', before securing high-heat formulations of the necessary colours, continuing with the etching. Finally, we had created three discs of a quality we were happy with, ready for shipping back to England, to be forwarded on to London, for cutting the audio.

Sadly, after all that work, the cutting engineer reported that even the minimal warping created by the laser heat was causing his cutting needle to jump; given the expense and inconvenience of a broken cutting stylus, he had no option but to abandon cutting just one minute in to the first track. Crestfallen, Nate and I regrouped and considered our next strategy. Still, in the interests of posterity, I have included these first attempts, as they are still attractive artefacts, if not quite the musical vessels I initially envisaged.

### *A.3.2 Veneered Dubplates*

Given the incompatibility between the processes of laser-etching and vinyl-cutting, we decided to split them, literally confining the results to separate substrates, before adhering them together. Motivated by the increasingly limited amount of time we had left to create these, Nate and I discussed using a variety of materials that would be easiest to work with, limiting our risks at

this late stage, yet allowed ourselves the luxury of selecting more unusual materials. We decided on some aluminium plates for the design half of the dubplate, which were much easier to work with than the PVC, and decided not to paint them, lest we create additional problems.

Being completely opaque, the dubplates allowed us the opportunity to create a dual-sided design (e.g. Figure 6), one design showing through the transparent vinyl as before, and one on the bottom of the plate. The second material I selected was a handful of wooden veneers, including some madrone and laurel burlled veneers, plus a simpler maple veneer; our only reservations were whether the veneers were going to be too thin to etch. Once the veneers arrived, our concerns seemed warranted, as they were very thin and rather distorted. According to our vendor, this was normal, as the veneers needed to be moistened and pressed flat, before being dried, ready for use.



*Figure 6. The rear design for the maple wood veneer on Gamma.*



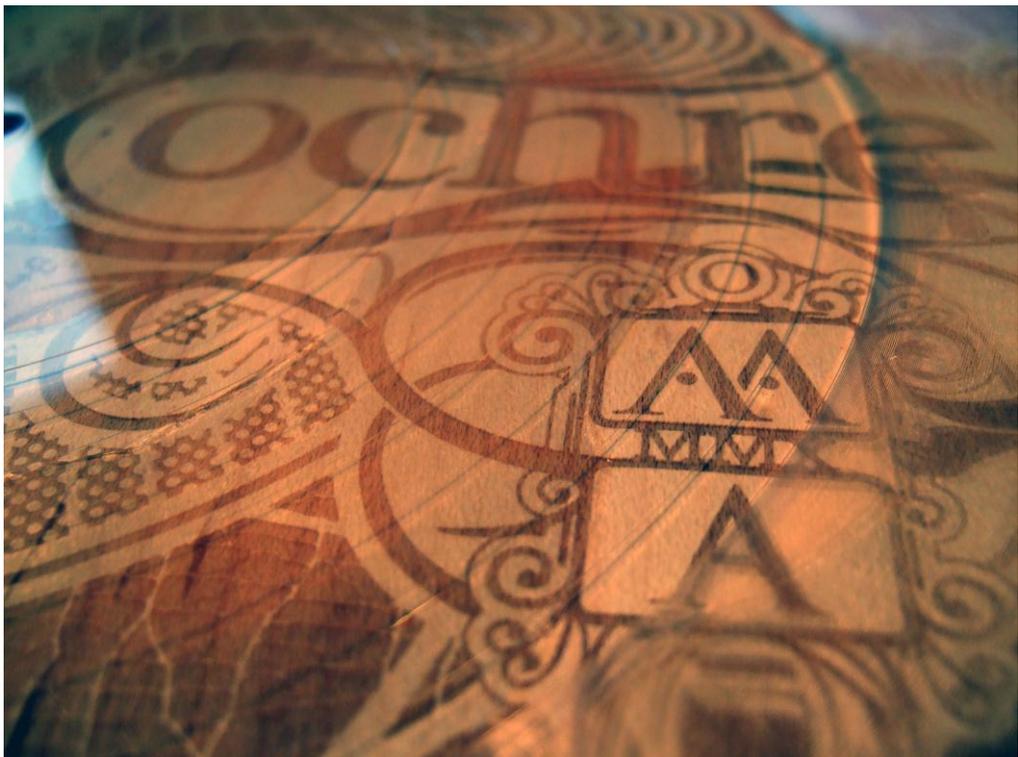
*Figure 7. Close-up detail of the wood veneer for Alpha.*

The veneers did etch remarkably well, far surpassing our expectations, with the laser enhancing the character of the wood grain beautifully (Figure 7). While the veneers were still somewhat warped, once they had been bonded to the underside of the dubplate, they flattened out nicely (though a small amount of warp remained, despite being pressed for 24 hours). We made sure to select a suitable epoxy to bond the two materials together, which cured to a transparent finish, allowing the unique designs to remain viewable beneath the grooves of the disc. Figures 8 to 13 on the following pages show the final bonded artefacts.

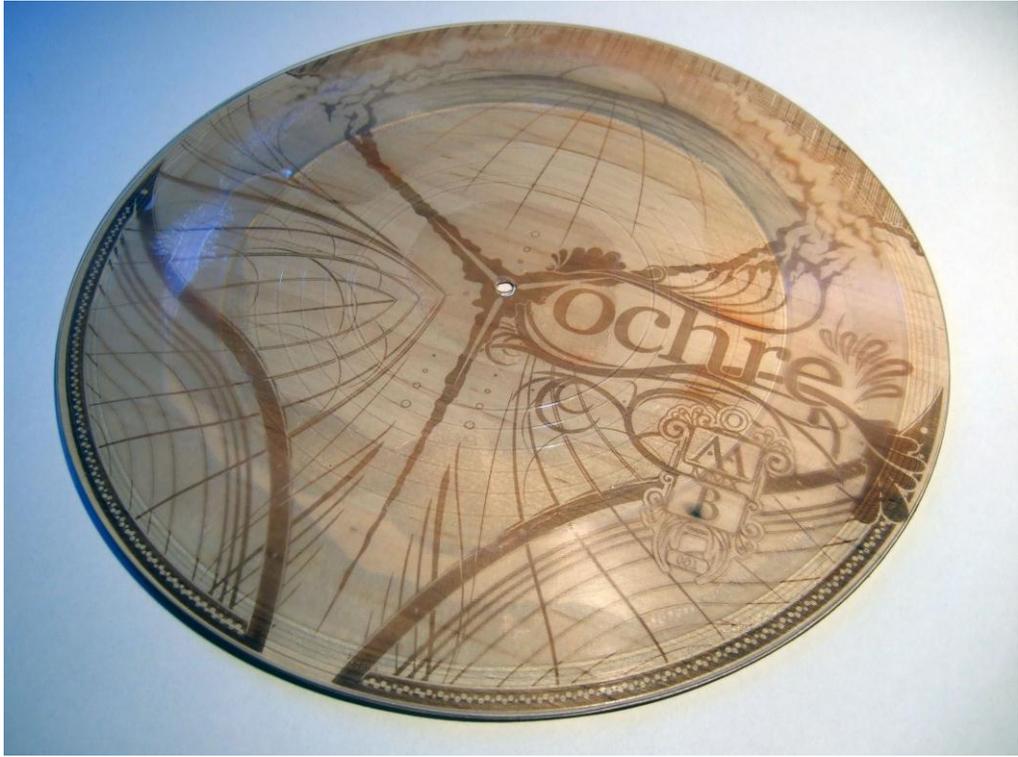
The aluminium plates also etched well, as expected, throwing up few surprises. However, we did encounter difficulties when it came to etching the actual outline of the disc, as the machine could not etch all the way through the relatively thick plate of aluminium. Instead we hired a CNC (Computer Numerical Control) Router to cut out the discs using a disc of wood as a template, before punching the final centre hole with a drill press. The machining of the aluminium plates took longer than expected, and I did not have time to bond them with the dubplates ahead of submission of this thesis (though the manufacturing of them is documented in the included DVD video). Aesthetically, the aluminium plates offer a stark contrast to the rough grain of the wood veneers, looking extremely sleek and futuristic compared to the wood veneer's weathered charm.



*Figure 8. The finished, veneered Auratic Artefact (Alpha)*



*Figure 9. Close-up detail of the grain and grooves on Alpha.*



*Figure 10. Beta, completed.*



*Figure 11. Close-up of the recording grooves on Beta.*



*Figure 12. Gamma, finished.*



*Figure 13. Close-up of Gamma.*

#### **A.4 Site-specific work: *Reception* [ref. included media: CDR track 2]**

[Note: In the interests of convenience and compatibility, the version featured on the included CDR has been mixed down to stereo, from its original 4.1 format.]

In addition to restoring ‘aura’ through the use of unique physical artefacts, I also had the opportunity to create a site-specific thematic piece of music for the Music and Machines VIII symposium, which took place during Newcastle’s biennial AV Festival.

I entitled the piece *Reception*, to reflect both the ‘Broadcast’ theme of the festival (thus, radio reception) and the venue (the reception area of Newcastle University’s Culture Lab). The symposium included several responses by various creative practitioners to the idea of the ‘haunted house’, inspired by cultural theorists such as Douglas Kahn, Jeffrey Sconce, Steven Connor, and Allen S. Weiss, who have proposed that broadcast and recording media share cultural resonances with ghosts, and the world of the dead. In particular, responses were invited to Antonin Artaud’s *Pour en Finir avec le Jugement de Dieu* (To Have Done with the Judgement of God), a recorded sound work originally commissioned by Radio France sixty years ago, but which was never broadcast due to its controversial nature. My nine-minute composition draws on sample material sourced from Artaud’s original piece. Written in 4.1 surround sound, my project necessarily eschewed my more usual quantised, beat-based approach (not least due to the acoustics of the site, which are exceptionally resonant). Instead, I focussed on the timbral and spectral characteristics of sound, experimenting with convolution processing and enhanced quadraphonic spatialisation, as well as continuing to work with the human voice, which constitutes the main material of Artaud’s piece.

As well as finding it refreshing, composing with the logistical limitations of placing loudspeakers in a cavernous reception area, the use of a dedicated subwoofer meant I was able to explore the use of sub-bass and its effect on the acoustic environment. Having much more energy than the higher frequencies within the piece, the sub-bass travelled much further throughout the building. The location-specificity of frequencies within a piece of work had not been something I had previously explored, and I enjoyed being able to experience the shifting atmosphere that occurred with my changing proximity to the reception area as I walked through the building. As such, I viewed this as less of an installation and more of a site-specific piece, being tied to the actual building itself, and dependent on the inherent acoustics of the building.

For me, the limitations in time and space imposed by both the theme of this project and the physical logistics of its ‘performance’ were central to reconstructing a sense of auratic

meaning and value to the piece. This sense of value and meaning, while similar to that I felt was created by the *Auratic Artefacts*, is clearly derived by very different means, yet is still governed by a sense of uniqueness.

The location and time-specific nature of *Reception*, plus the sense of permanence, uniqueness and tactile aesthetics of the *Auratic Artefacts*, successfully restored a sense of meaning to my practice. However, as products of my creative process rather than integral parts of it, the sense of meaning they have restored still firmly resides in reception; in both cases the music was written in a similar manner to my 'Like Dust' album. There still lies the challenge for me to attempt to further incorporate a meaning and crafting to my practice; to rejuvenate it with a more tactile, multi-sensory agency, without eschewing the technical skills I have accrued through my compositional use of computer software. But in order to do so, motivated by my experiences during my collaboration with Benet regarding optimal modes of creative and technical engagement, I need to further investigate and understand how these modes of production are informing or influencing my creative practice. Only then will I be prepared to devise a creative strategy that balances not only these prismatic modes of engagement during production, but also the sense of auratic meaning and value between the creative process and its auratic output. Lastly, this further research will also provide a key means of understanding our collective proclivity for attributing emancipatory factors to technology, without considering the sacrifices we make in the process.

## Chapter 4. Determining the Techno-Romantic

Throughout the first three chapters I argued that an ember of techno-romanticism existed at the core of Attali's 'Composing' chapter from *Noise*, more recently rekindled by the disintermediated, distributive potential of the internet, and fuelled by optimistic technologists following the boom and maturation of the so-called 'Web 2.0'. I identified a rupture between the perspectives of musicians and listeners, in that the emancipatory modes of reception afforded by ubiquitous dematerialised music were not met by similarly empowering modes of production. On the one hand, as a listener and music lover, I have been spoilt by the seemingly endless quantity of music generously made freely available online, in addition to the vast catalogues of music to be explored from within commercial download stores such as iTunes, Bleep, and eMusic etc. Yet on the other hand, as a producer of music, I feel increasingly marginalised by the large aggregative corporations that stand to gain from 'long tail' economics, while I struggled to find an audience for my own music. I equated these two imbalanced perspectives of prismatic consumption and homogenous production with Attali's 'Composing' and 'Repeating' chapters respectively, illustrated by the Adorno-Benjamin debate.

From my own perspective as a computer musician, the lack of materiality within my practice, plus the dematerialised music that results, adding to the online glut of amateur 'prosumerist' music, is dissatisfying and unfulfilling. As noted in chapter 2, the sheer amount of music available online, combined with portable players, greatly increases the depth and breadth of modes of reception employed by listeners. However, these positively enriching and liberating modes of reception do not appear to be reflected in modes of production to the same extent. I feel in many respects less mobile, increasingly tethered to my computer as the various tasks I perform on it, including writing music, are homogenised by this technological monolith; whether writing music or designing my web site, composing emails or purchasing consumer goods, I seem only ever to be gazing at my computer monitor, interacting through my keyboard and mouse. Consequently, as a central aspect of my doctoral research, I have explored various ways to rematerialise both my music and my practice.

The previous chapter documented my attempts to rematerialise my music by creating unique, physical 'auratic artefacts' that serve as a means of achieving a tactile, meaningful and memorable means of permanence for my music; these serve as a reminder of what I have achieved in extracting my music from the technological frame of my computer and its software. Additionally, the creation of these artefacts has provided me with a definite sense of

accomplishment, imposing a definitive conclusion to my work. Along similar lines, I have detailed my venture towards creating site-specific works, creating meaning and restoring value to my music by limiting its exposure in time and space, as I felt my musical output had become increasingly disposable and meaningless, marginalised by the technical homogeneity of a computer-centric practice.

It is with some surprise, then, to continually read about the potential of dematerialised music distribution, along with continued optimism surrounding the supposed democratisation of computer-based music technology, with increased access to the software tools for music production and distribution. While these are indeed positive factors, to which my limited success to date is indebted, I also feel this optimism tends to obscure the possibility of a more critical evaluation of the ways that these new technical tools affect us as creative artists. I personally feel so entrenched and invested in the use of my particular music sequencing software that I cannot envisage writing music without it; more than merely a tool or an instrument for my own use, my musical practice has become wholly dependent on software, shifting accordingly to meet its demands and limitations.

While initially seduced by the compositional opportunities presented by modern recording software and the distributive potential offered by the internet, I have found myself becoming frustrated when what I wish to do is confined by the compositional conditioning imposed through the use of my software. I would therefore question whether the high value attributed to the emancipatory role of technology (as identified by Attali in ‘Composing’ and by Benjamin in ‘Work of Art’, for example) is fully justified. In this chapter, I wish to challenge the assumption that these technological modes of production are necessarily emancipatory. Additionally, I wish to investigate and examine the possible origins of this utopian techno-romantic predisposition, questioning not only how we interact with technology, but also how it interacts with and affects us. This is with a view to attempting to breakdown the technological monolith and discover what I can reclaim in my own creative musical practice.

#### **4.1 Composing and Technological Determinism**

Marshall McLuhan’s oft-quoted dictum, ‘the medium is the message’,<sup>175</sup> is commonly deployed when critically examining the significance of the internet, and for good reason, as

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<sup>175</sup> McLuhan, *Understanding Media* (London, New York: Routledge, 2001).

‘convergence culture’<sup>176</sup> has seen the internet’s ‘global village’ assimilate a variety of previously discrete media, to be presented through its single experiential portal. By noting a shift in modes of engagement that occur during this convergence, we have a chance to assess and identify if and how our use of these technologies, rather than simply the contents delivered by them, affects and alters us.

McLuhan is a clear and unwavering advocate of technological determinism, i.e. the school of thought contending that technology itself is an agent of social change; that it “transform[s] its users directly”.<sup>177</sup> At the opposite end of this dichotomy, technological voluntarism posits the (perhaps reflexive) notion of technology as a neutral tool, placing agency directly in the hands of its users. McLuhan uses a typical voluntaristic reference from media pioneer General David Sarnoff, to argue for his own deterministic position: “[W]e are too prone to make technological instruments the scapegoats for the sins of those who wield them. The products of modern science are not in themselves good or bad; it is the way they are used that determines their value.”<sup>178</sup> This statement, derived apparently from a belief in the immutability of being human, for McLuhan immediately betrays “the true Narcissus style of one hypnotised by the amputation and extension of his own being in a new technological form.”<sup>179</sup> For McLuhan, such a viewpoint (he terms this ‘Narcissus narcosis’) completely ignores the notion of our senses being not only extended through technology, but also amputated and replaced in the process. As similarly noted by *Neuromancer* author William Gibson, “The street finds its own uses for things”,<sup>180</sup> and as such, while we are part of this street (or superhighway, to extend the metaphor) we will be informed and affected as part of this environment while engaged with it. As such, technology is not merely a neutral tool under human employ, but a hypersensitive, and especially in the case of the internet, totalising extension of our audio-visual senses (or as McLuhan would assert, our nervous system), exerting agency on us.<sup>181</sup> We cannot help but be informed by not only the information we receive, but also its means, and to ignore this “ignores the nature of the medium, of any and all media”.<sup>182</sup>

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<sup>176</sup> A phrase popularised by Henry Jenkins in his 2006 book *Convergence Culture: Where Old and New Media Collide*, detailing the consolidation of media channels into a single-stream of accessible (and increasingly mobile) information.

<sup>177</sup> Taylor, *Strange Sounds*, p. 26.

<sup>178</sup> General David Sarnoff, in McLuhan, *Understanding Media*, p. 11.

<sup>179</sup> McLuhan, *Understanding Media*, p. 12.

<sup>180</sup> Gibson, William, ‘Rocket Radio’ in *Rolling Stone* (June 1989).

<sup>181</sup> McLuhan, *Understanding Media*, p. 4.

<sup>182</sup> *Ibid.*, p. 12.

The issue of technological determinism is complex, fraught with assumptions, polemics and staunch absolutes. Sympathising with McLuhan, Friedrich Kittler attributes the phonograph to an amputation of our memory: “ ‘The more complicated the technology, the simpler,’ that is, the more forgetful, ‘we can live’. ... We all know hits and rock songs precisely because there is no reason to memorise them anymore.”<sup>183</sup> As recognised by Taylor, “We have all had the experience of being reminded of a song or lyric, which seems almost to trigger our singing or humming it”,<sup>184</sup> as though we are mindlessly prompted by the recordings, replacing our ‘mnemotechnology’, as Kittler terms it;<sup>185</sup> diminishing our capacity to remember the songs ourselves without technological support. Like Adorno’s deterministic, controlling ‘Culture Industry’, such a view does not allow for the possibility of agency within the social sphere surrounding the technology. The notion, for example, that we may have attributed a particular meaning to a piece of music, creating fond associations or personal rituals with a particular piece of music, or that we may simply enjoy singing along, does not appear to enter the equation. As such, the tendency towards a prescriptive, deterministic renunciation of agency in arguments such as Kittler’s are undermined by such social and personal considerations. Taylor attempts to navigate between the problematic poles of technological determinism created by divorcing a reified monolithic ‘technology’ from a similarly monolithic ‘social’, avoiding the temptation to wholly place agency with either. He prefers to view technology “as neither voluntaristic nor deterministic but as caught up in a complex, fluid, variable dynamic of each”,<sup>186</sup> proposing Martin Heidegger’s argument of technology as ‘revealing’, i.e. that which is revealed depends on the mode of revealing employed. Michael Heim sums up this ontological approach succinctly: “The type of question we ask, philosophers agree, shapes the possible answers we get. The way in which we search limits what we find in our searching.”<sup>187</sup> Taylor pragmatically sidesteps the problematic issue of agency, instead purporting that “technology, while neutral in and of itself, runs the risk of decreasing our humanity or creating a rift between our creative sides and our scientific sides.”<sup>188</sup> I suspect this line of enquiry will be more fruitful and salient given my practice, considering that it consists of some very clear, and often conflicting, delineations between the creative unconscious and acute technical awareness. I will therefore use Heidegger’s

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<sup>183</sup> Kittler, Friedrich, *Gramophone, Film, Typewriter* (Stanford University Press, 1999), p. 80.

<sup>184</sup> Taylor, *Strange Sounds*, p. 28-29.

<sup>185</sup> Kittler, *Gramophone, Film, Typewriter*, p. 80.

<sup>186</sup> Taylor, *Strange Sounds*, p. 30.

<sup>187</sup> Heim, Michael, *The Metaphysics of Virtual Reality* (Oxford University Press, 1993), p. 15.

<sup>188</sup> Taylor, *Strange Sounds*, p. 30-31.

principles as a basis for my argument for a re-assessment of computer technology within my own practice, that moves away from a deterministic understanding.

Looking more closely at his 1954 essay, ‘The Question Concerning Technology’, Heidegger appears at great pains not to portray modern technology in a pessimistic light; he does not wish to put technology on trial. Instead, he is concerned with how we access and understand the ‘essence’ of technology:

Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it. But we are delivered over to it in the worst possible way when we regard it as something neutral; for this conception of it, to which today we partly like to do homage, makes us utterly blind to the essence of technology.<sup>189</sup>

McLuhan’s issue of technology as ‘hypnotising’, blinding us to its influence once we regard it as a neutral tool, appears to reflect Heidegger’s concerns, although Heidegger addresses the issue with a much lighter touch than McLuhan, as a decidedly ‘soft’ determinist. However, Heidegger’s issue of the ‘essence’ of technology and how it is revealed, requires clarification, as “the essence of technology is by no means anything technological. Thus we shall never experience our relationship to the essence of technology so long as we merely conceive and push forward the technological, put up with it, or evade it.”<sup>190</sup> The essence of technology is not simply what it is as an object (for technology can never be reduced to the status of a neutral instrument), more the meaning it invokes during the time endured through its use. For Heidegger, the technology with which we physically engage (the ‘instrumentality’)<sup>192</sup> acts as little more than a cursory preamble towards understanding the essence of technology. We have to consider how our instruments engage with both other instruments and nature, and whether this engagement is benign and harmonious or something altogether more intricately subversive. In considering modern technology as a mere tool, as a means for man, venturing no further than its instrumental facade, we will be unable to reveal and understand its essence, and whether this essence, this truth (*aletheia*),<sup>193</sup> is revealed via a poetic (*poiesis*, a Greek term meaning ‘to make’, from which ‘poetry’ is derived) mode of revealing—a ‘bringing-forth’,<sup>194</sup> or a technical mode of revealing. Modern industrial and computer technology,

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<sup>189</sup> Heidegger, Martin, *The Question Concerning Technology and Other Essays* (Harper, 1977), p 4.

<sup>190</sup> *Ibid.*, p 4.

<sup>192</sup> *Ibid.*, p 12.

<sup>193</sup> *Ibid.*

<sup>194</sup> *Ibid.*, p 10.

through a technical, non-poetic mode of revealing, instead reveals a ‘standing-reserve’,<sup>195</sup> to be challenged and set-upon, exploited via a complex technical matrix (Heidegger calls this underlying system of interconnected technical nodes ‘Enframing’, from the German *Gestell*).<sup>196</sup>

Understanding the abstract nature of these philosophical constructs, Heidegger provides us with examples illustrating how the essence of technology is revealed, such as his windmill/hydroelectric power plant comparison. Our use of the windmill to utilise energy provided by the wind is benign, relying on a constant source of wind, without which the mill will immediately cease to work. The link between the wind and a functioning mill is direct, explicit and harmonious; it is a poetic revealing (*poiesis*). The windmill is poetry in motion. Contrast this with the hydroelectric power plant:

The hydroelectric plant is set into the current of the Rhine. It sets the Rhine to supplying its hydraulic pressure, which then sets the turbines turning. This turning sets those machines in motion whose thrust sets going the electric current for which the long-distance power station and its network of cables are set up to dispatch.<sup>197</sup>

In creating a dam of stockpiled water to provide the hydroelectric power station with a constant supply of water pressure, technology has now *challenged* nature, exploiting it for maximum yield via scientific technological means. No longer is the Rhine revealed simply as a poetic, aesthetic beauty. Instead, the mode of its revealing is now monopolised by a calculable scientific Enframing, concerned with how to extract the maximum amount of energy from the river’s ‘standing-reserve’ (i.e. its latent potential energy, such as the stockpiled water pressure created with the formation of a hydroelectric dam, used to spin turbines, creating electricity, to be transmitted and sold to consumers, so they may run their

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<sup>195</sup> Heidegger, Martin, *The Question Concerning Technology and Other Essays*, p 15.

<sup>196</sup> Heidegger chooses his words extremely carefully, deliberately and methodically working through the intricately connected etymology of his chosen terms to convey his ideas. For instance, on the etymology of ‘technology’: “The word stems from the Greek, *Technikon* means that which belongs to *techne*. We must observe two things with respect to the meaning of this word. One is that *techne* is the name not only for the activities and skills of the craftsman, but also of the arts of the mind and the fine arts. *Techne* belongs to bringing-forth, to *poiesis*; it is something poetic.” (pp. 12-13.) Thus, traditional crafting (*techne*), as a praxical engagement of knowledge and technology, poetically (*poiesis*) brings-forth and reveals its true essence (*alethia*). Such a path is typical of the modes of revealing common to the arts and pre-industrial, agricultural technology. In stark contrast, modern industrial technology employs a different mode of revealing that unveils a technological Enframing (*Gestell*, an interconnected system or network). Rather than an immediate poetic, harmonious and symbiotic revealing, Enframing is a challenging of nature, to unlock, extract and convert stored resources (nature’s ‘standing reserve’), creating a stockpile of potential. Mass-production, intensive farming and fishing, coal, oil and uranium extraction, building dams for hydroelectric power stations etc., are all examples of ‘challenging’ technologies, with extensive and invasive technological networks and supply chains (*Gestell*).

<sup>197</sup> Heidegger, *The Question Concerning Technology and Other Essays*, p 16.

electrical goods). In short, *Gestell* presents a convoluted technological detachment from nature, and once this mode is adopted, it remains unchallenged.

It is this modal transition from the poetic to the technical that Heidegger identifies as a potentially insidious symptom of modern technology. The harmonious symbiosis between man and nature, typified by Heidegger's windmill example, has shifted in favour of man's dominance via the 'challenging' action of stockpiling water (Heidegger uses the term 'setting-upon', *stellen*, for this challenging, unlocking and exploiting 'standing-reserve'). In implementing this technology, Heidegger argues that man has polarised the modes of revealing that make up *techne*, leading to a single dominant technical mode. In return, the complex system of Enframing feeds back and informs man's consciousness accordingly, conditioning man to view the rest of the world via such a technical mode, at the expense of all prior modes of revealing. In viewing the world through this dominant technical filter we risk being blind to the richness and poetic beauty that would have otherwise been unveiled to us, thus to some extent dehumanising ourselves.

Carlos Palombini reiterates and clarifies Heidegger's concerns with the inevitable conditioning of Enframing: "The essence of modern technology starts humans upon the way of that revealing through which the real everywhere, more or less distinctly, becomes standing reserve."<sup>198</sup> Neil Postman affirms this 'reformatting' of the mind, proposing that "new technologies change what we mean by 'knowing' and 'truth'; they alter those deeply embedded habits of thought which give to a culture its sense of what the world is like—a sense of what is the natural order of things, of what is reasonable, of what is necessary, of what is inevitable, of what is real."<sup>199</sup> Of course, computer music will also be subject to this phenomenological polarisation; only now, ten years into my practice, do I feel I have been able to reflect upon and articulate these concerns, and set about addressing them.

To return to my own practice with Heidegger in mind, it would appear I engage in two conflicting modes of revealing when negotiating composition through the use of the computer. The first mode, through which I seek to transparently convey my musical intentions, can be thought of as a more poetic flow of creativity—the ideal composition state, if you will. The second, by contrast, is a visually-dominated mode informed by a technical Enframing; it is a language of numbers, of bits and bytes, of virtual instruments, plugins, options and parameters—what we may recognise as the engineering portion of music

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<sup>198</sup> Palombini, Carlos, 'Technology and Pierre Schaeffer', *Organised Sound* (vol. 3, no. 1, Cambridge University Press, 1998), p. 38.

<sup>199</sup> Postman, Neil, *Technopoly* (Vintage Books, 1992), p. 12.

production, rather than the compositional. If we were to contend that the assertions of Heidegger are correct, with his technical mode of Enframing dictating and monopolising subsequent modes of revealing, then given the technological bias of my music software, this second technical mode will inherently dominate, alter and inform the first. Couple this with the assertion made by McLuhan, that the hypnotic nature of technology blinds us to considerations external to the current technical mode, then we are left with a problematic compositional foundation, of a primarily technical bias. As Heim writes, “Once we notice how computers structure our mental environment, we can reflect on the subconscious agencies that affect our mental life, and we are then in a position to grasp both the potential and the peril.”<sup>200</sup> I would therefore posit that this is not merely a case of technological determinism versus voluntarism, but of an acceptance that our technological considerations beget a framing of consequent considerations. My choice of music software, for example, is rarely questioned; once inside the virtual walls of my software I see only the options it presents, and assume these to comprehensively meet my artistic needs. Technological determinism presumes a fatalistic inevitability of the effects of technology, yet I believe that while these technically polarising effects are very real, it is also possible to not only gain an awareness of these effects, but to work to their strengths when necessary. When technical modes of engagement, or ‘revealing’, do not prove conducive to the compositional task at hand, I wish to strive towards a recognition of this, extricating myself from these technical modes, and instead engage with creative modes as necessary. In short, I wish to be able to call upon the full spectrum of modal engagements, including the preclusive technical modes through which I have nevertheless developed valuable technical expertise. Only in developing an understanding and awareness of my technical engagement with dematerialised music software (and the dematerialised music that results from its use), may I set about addressing this through my compositional ‘rematerialising’.

## **4.2 The Delegation of Techne**

It is this surreptitiously suggestive and almost prescriptive nature of our technology that leads me to a more critical view of techno-romanticism. It is easy after all, to get caught up in the fervour of technological development if you are within the eye of the storm, and will therefore encounter considerable difficulty in securing an objective footing, “for any medium has the

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<sup>200</sup> Heim, *The Metaphysics of Virtual Reality*, p. 15.

power of imposing its own assumption on the unwary.”<sup>201</sup> According to McLuhan, it is only “when standing aside from any structure or medium, that its principles and lines of force can be discerned.”<sup>202</sup> It is only when extracting myself from this network, stepping outside the constant stream of information and turning off the computer, do I notice how fragile and ephemeral my dematerialised practice is.

Working as a computer musician, I have become very aware of my increasingly abstracted, homogenised and solitary practice, whereby my musical composition (via software synthesisers and sequencers), music distribution, communication (either via the somewhat oxymoronic ‘social media’—Facebook, MySpace, Twitter etc.—or via email), and even music listening, are all mediated via the computer.<sup>203</sup> As the results of my practice create mostly intangible results in the form of dematerialised music to be uploaded, I am beginning to feel I have lost any connection I once had with my own music, lacking any essence of closure. Indeed, knowing that all my work effectually ceases to tangibly exist, as information alongside the work of millions of other musicians, does not engender a feeling of empowerment or liberation, once I am ‘offline’.<sup>204</sup> Here McLuhan’s notion of amputation and extension resonates; once the musical instrument has been subsumed as part of the recording and distribution technology, accessible directly through extensible intention, bypassing immanent muscle memory and the limitations of a linear performance, it becomes both an augmentation and a crutch. One might argue similarly that a guitarist is rendered helpless if the strings on the guitar break, but even so, the guitarist’s knowledge and technique can be retained by the performer and transferred to a spare guitar or even someone else’s guitar. For a computer musician, a delegation (i.e. amputation) of technique, passed over to a unique combination of music software is necessary, which is then informed by the user’s knowledge. But should the computer fail, so does the technique along with it, rendering controller or interface devices impotent, and leaving the user with production knowledge he or she is unable to realise in the same way. No matter how intricate and expressive my input devices

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<sup>201</sup> McLuhan, *Understanding Media*, p. 16.

<sup>202</sup> *Ibid.*, p. 16.

<sup>203</sup> Although I do wish to acknowledge the existence of specialised controller surfaces and interfaces, whether as attempting to recreate a tactile mixing desk or equipment knobs, or something altogether more experimental such as gestural, pressure, breath and other sensory controllers, there still remains a distinct sense of detachment; the technical abstraction cannot easily be bridged.

<sup>204</sup> Anyone who, as a computer musician, has had to field the dreaded question when claiming to be a musician, “which instrument do you play?” will understand this precarious position between a *potential* of control and utter helplessness; all it takes is a computer crash, a refusal to boot up the operating system, to bring this perspective back into focus.

are, my MIDI controllers, keyboards (both musical and computer) and mice are merely technical links in a chain of technical language devoid of poetic revealing.

As Heidegger reminded us, the Greek *technikon*, from which ‘technology’ is derived, belongs to *techne*, encompassing ‘technique’ as both the skills and activities of the craftsman, as well as the artist. Peter Manning notes Adorno’s similar remarks in 1958, specifically concerning the integral role of technology in modern composition:

The meaning of the Greek word *techne* from which both ‘technique’ and ‘technology’ are derived offers an indication of the unity of this concept with art. If art is the external representation of something internal, the concept of technique embraces everything which pertains to the realisation of that interior substance. In the case of music, not only the realisation of spiritual substance in the score is involved, but the transformation which makes this score accessible to sensory perception as well. In short, both production and reproduction are involved. Musical technique embraces the totality of all musical means: the organisation of the substance itself and its transformation into a physical phenomenon.<sup>205</sup>

Adorno clearly acknowledges the influence of our technology on the compositional process, not simply as a fingerprint on the final work, but as integral and inextricable to the work. This raises the question: how much of my music depends explicitly on my music software? In considering the tenability of Heideggerian modes at work during composition, I suspect the attributable influence of my software on my music production is considerable; Heidegger’s Enframing, manifested in the computer system through which I write music, will undoubtedly influence the compositional choices I make.

But is this at all surprising? We do not have to venture very far to notice the technological entrenchment of modern music. Simply turning on the radio or TV would instantly reveal the product of a variety of heavily ‘autotuned’ pop vocals,<sup>206</sup> vast sound libraries of sampled instruments,<sup>207</sup> virtually-replaced drum hits for unmatched ‘acoustic’

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<sup>205</sup> Adorno, in Manning, Peter, *The significance of techne in understanding the art and practice of electroacoustic composition* (Cambridge University Press, 2006), pp. 82-83.

<sup>206</sup> ‘Autotuning’ refers to the practice of using pitch-correction plugins such as the popular Autotune plugin developed by Antares. This allows singers to record their phrases and melodies, before tuning them in real-time, either chromatically or to a predefined scale, correcting unduly flat or sharp notes. Initially developed as a transparent corrective tool, the extreme use of Autotune has created a specific robotic vocal style, with audible stepping between the notes of a scale (perhaps the earliest high-profile use of Autotune in this manner was Cher’s ‘If You Believe’). So pivotal was the use of Autotune to this track, that its producers initially denied using Autotune, instead claiming the use of an alternate effects unit).

<sup>207</sup> Given the exponential growth in hard disk storage capacities, sample libraries have exploded in size, seeking to recreate acoustic instruments with unprecedented realism. Entire orchestras can be convincingly scored and recreated, drum kits can be swapped-round and individually tailored virtually (or sloppy human performances can be tightened up, with individual drum hits replaced with samples using tools like Drumagog), and even virtual choirs can be created using complex ‘word-building’ tools used to recreate phrases from phonetic

drumming consistency, as well as the culmination of modern mastering: the so-called ‘loudness wars’.<sup>208</sup> There can be no doubt that the possibilities of technical sound manipulation now extend to all aspects of modern music production, either recorded or performed live. We can fix the pitch of our voice or violin alike, correct the timing of our guitar riffs, contort and reshape sample material to be repurposed at our will.

Whereby the vast majority of my practice is concerned with technological engagement, rather than as a separate secondary process (as in recording or mixing in a large studio environment), I feel I could stand to reduce the ratio of technical to creative processes. If, as Adorno stated earlier, “musical technique embraces the totality of all musical means”, then I would need to investigate a means of applying my own technique to work *in partnership* with my software praxis, rather than simply allowing the delegated technique, inherent to my software, dictate my compositional direction. This is a difficult undertaking to consider, if not entirely unfeasible; I will need to work out a careful balance between the appropriate technical modes and a more personal, poetic, crafting approach to *techne*.

Manning also notes a primary compositional dilemma identified by Agostino Di Scipio, familiar to electroacoustic and studio composers: “How can I use the available existing task-environment to realise my own ideas of composition?” Or more flexibly, not to mention dauntingly, “How can I design the tools that are necessary to realise my own ideas of composition?”<sup>209</sup> These are questions continually raised by composers and producers, whether consciously or not (as in the common and indirect case of continual equipment acquisition, especially typical of electronica producers),<sup>211</sup> and illustrate the issue of where to draw the line with respect to the authorship of one’s musical tools in addition to the actual music. Software such as Cycling ‘74’s Max/MSP are arguably more open-ended than a linear sequencing program such as Steinberg’s Cubase, yet also consequently require much more technical groundwork to serve a comparatively simple task of multitrack recording. Max/MSP

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building blocks.

<sup>208</sup> The use of software peak-limiters, or ‘brickwall’ limiters as they are also known, has allowed mastering engineers to increase the loudness of digital audio recordings far beyond the limits previously imposed by physical analogue recording media. The consequent reduction of dynamic range, while indeed resulting in a loud and initially impressive recording, also risks engendering listening fatigue over prolonged periods. For more information on the so-called ‘loudness wars’ and its detrimental effect on recordings, please visit [www.turnmeup.org](http://www.turnmeup.org).

<sup>209</sup> Di Scipio, Agostino, cited in Manning, *The significance of techne in understanding the art and practice of electroacoustic composition*, p. 83.

<sup>211</sup> So-called ‘GAS’ or ‘gear acquisition syndrome’ is a common subject of discussion among electronica producers, usually resulting from a studio showcase, whereby it will be apparent how efficiently or otherwise the producer is utilising his or her equipment. Here issues of practicality, consumerism or ‘collectionism’, as well as the creativity of technological impositions often merit discussion.

is best suited to solve a very specific problem, such as orchestrating the interaction of different sensors or triggers with appropriate sound-manipulation effects within an art installation, for example. By contrast, attempting to bend the artistic assumptions imposed by an empty Cubase project to similarly specific and individual artistic needs will be frustrating. Such software varies in its flexibility, and in this case, a high level of flexibility inherently comes at a price of technical aptitude and preparation (i.e. time spent not writing music). One may argue that the technical awareness required for proficient use of Max/MSP will engender precisely Heidegger's technical modes of revealing, affecting any subsequent composition. Moreover, the object-oriented nature of the program, involving highly interconnected causal modules to be patched together, practically illustrates Enframing explicitly.

Even within a relatively prescriptive framework, as presented by a blank Cubase project, I can feel as though I have to re-invent the wheel with each composition. Reticent to reuse or recycle effect or synthesiser presets lest my compositions appear lazy or contrived, I am feeling an increasing arduousness about my practice, which I feel would not exist if I were, for example, scoring for a small string ensemble. The string instruments are accepted as providing a limited breadth of tones and timbres, yet are clearly perfectly suited for realising a composition, capable of evincing a huge range of expressive articulation. They are still technically 'presets', much in the same way as any synthesiser sound is 'pre-set', yet they provide me with a more streamlined platform for composition. Why is this so? Let us consider the term used to denote single synthesiser presets, or 'patches'. The term is a relic of the age of modular synthesisers, whereby to achieve a particular sound, every synthesiser had to be physically patched together using a series of audio cables, akin to 'patching' into a telephone exchange.<sup>212</sup> Each synthesis element, whether a sound-generating oscillator, a sound-sculpting filter module, an envelope generator or an amplifier, was a discrete physical box to be connected together with patch cables. Again, like its virtual counterparts such as Max/MSP or Native Instruments' *Reaktor*, the modular synthesis is an explicit depiction of Enframing, as a *schematic* (from the Greek *schema*, meaning 'form') representation of an interconnected system or network.<sup>213</sup> Once this network has been revealed to you, it of course beckons you to

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<sup>212</sup> While such modular synthesisers still exist today, they are joined by less flexible but much easier to use fixed-architecture synthesisers or semi-modular synthesisers (which have a fixed architecture unless you choose to create additional patch connections). The popular Minimoog synthesiser, for example, is a fixed-architecture synthesiser consisting of three oscillators, a single filter and an amplifier (with their own envelope generators), plus an LFO (low-frequency oscillator) for modulation, e.g. used for vibrato.

<sup>213</sup> This is a pertinent and striking connection between the use of synthesisers as modular networks, Heidegger's technical mode of Enframing, and Plato's mathematically perfect realm of the forms, the latter of which I will

get involved, to lose yourself amidst the interactions between its myriad elements, enticing you with the notion that you can create an infinite number of sounds. Vivially, we will not recognise that these infinite sounds must therefore be realised within the confines of such a system, and as such will require the adoption of a technical mode of revealing. The narrow-focus intricacies considered when creating a synthesiser patch will therefore take precedent over the wide-angle narratives of musical composition, engendering a Heideggerian modal rupture between them.

Indeed, when working within a clear genre or writing for a specific instrument, I can shrug off the bulk of decisions usually encountered when preparing an electronic piece of music, such as: Which synthesiser should I use? What kind of sound should I create on it? Should I use, create or process samples for this piece? Such technical or engineering decisions, while often resulting in creative additions to a piece of music, also tend to interrupt or conflict with the flow of tonal composition. Deliberately restricting oneself to writing for a particular instrument, on the other hand, may ensure a free-flowing of lyrical musical form and composition, at the expense of the odd, rich other-worldliness that I love so much about electronic music. Certainly, the compositional limitations, whether imposed deliberately, by the nature of the software used, or by the modes of revealing necessitated by them, can all foster a state of creativity. However, I feel software answers a very specific question rather than offering a blank canvas. Carefully chosen for a specific purpose, complementing techniques provided by a particular software environment can result in effortless composition. But unless you have a specific problem, software instead offers infinite limitations; technical answers to questions posed in a language foreign to that of musical composition.<sup>214</sup>

As far as Di Scipio is concerned, whether a composer has designed tools specifically for a particular creative vision, or worked within the constraints of an existing tool, both remain integral facets of a crystallised praxical journey, underlining the importance of this technologically-delegated *techne* during the aesthetic consideration of electronic music.<sup>215</sup>

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discuss later in this thesis, as it has deep implications for techno-romanticism and its predilection for technological emancipation.

<sup>214</sup> Which may go some way to explaining the sprawling setups of many successful electronic musicians, typically using a handful of sounds (or just a single sound) from individual synthesisers. This also raises the subject of consumerism fostered and encouraged by the music technology industry, a subject covered expertly by Paul Théberge within the first chapter of *Any Sound You Can Imagine*.

<sup>215</sup> “In electroacoustic music the making of a work is, to some extent, captured and documented in the technical tools adopted or specially designed by the composer. The composer’s relationship to the materials and the forms of his/her art (which to me is the very object of any analytic view) are mediated by those design tools—tools of work and thought. They cannot be considered foreign to an aesthetic approach, for they do reflect the artist’s knowledge and his/her conception of sound and music, and to some extent could be studied. The technological

### 4.3 The Mind-Body Dualism: Creative and Technical Modes of Engagement

But what of the body in my own practice? If the use of my computer and its music software is a McLuhanistic extension of my nervous system, and the *techne* involved in using such a compositional system has resulted in a delegation of technique to my software, informed by my knowledge of the sequencing environment, then it would appear I have almost completely bypassed the use of my body. Or at least, the physical extent of my composing inside Cubase boils down to a set of abstracted skills bearing little relation to the compositional results; to witness my typing or mouse-clicking betrays no connection with a particular piece of software, never mind the music. Instrumental performance is certainly one way to circumvent this technological abstraction, as is singing, reintroducing the body into the compositional process. Indeed, as documented in the last chapter, I have incorporated both into my practice, but have found they both require separate modes of engagement from those of the computer (as I discovered during the creation of my album, flitting between either activity involves a jarring rupture of the unconscious ‘flow’ involved with creative engagement),<sup>217</sup> and as such resist integration, steadfastly remaining individual activities. But while at the computer, programming and composing with my virtual synths and samplers, my body may as well be bypassed completely, as though attempting to realise a Cartesian fantasy of direct connection between the mind and the technical software.

Sociologist Daniel Bell labels computers as part of a group of ‘intellectual technologies’, which extend our mental capabilities rather than physical, in contrast to the production machinery of the industrial age.<sup>218</sup> The strengths of software and computing lie in the speed and accuracy of calculations, and as such, music must be translated and converted into the digital realm to be processed and manipulated, whether explicitly via the direct digital encoding of audio streams, or implicitly via the semiotics of MIDI information. These actions are conveyed to us in terms and forms we can understand, such as musical notation, visual waveforms, and even graphical simulacra of tactile equipment (the mixing desk, effects units etc.). In an engineering environment such as the mixing or mastering stages of music production, the mental technical dialogue between engineer and computer software is

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tools embody the theory of music behind the composer’s attitude and work (knowledge of the field), and objectify the cognitive strategies involved in using the theory (action knowledge).” Di Scipio, in Manning, *The significance of techne in understanding the art and practice of electroacoustic composition*, p. 83.

<sup>217</sup> ‘Flow’ is a term used by psychologist Mihaly Csikszentmihalyi in *Flow: The Psychology of Optimal Experience* (Cambridge University Press, 1988).

<sup>218</sup> Bell, Daniel, *The Coming of a Post-Industrial Society* (Basic Books, 1973).

conducive to the workflow aims and demands, i.e. the engineer listens, and makes adjustments in response to what he hears. For electronic music, which often lacks distinct delineations between the songwriting, recording and engineering stages, the Heideggerian rupturing I mentioned earlier will invariably ensue; consequently, the technical mode of engagement will be biased towards the engineering processes.

Brian Eno voices similar concerns with a rupturing of the technical from the creative, and the suppression of bodily agency in the modern, software-centred studio. On the differences between traditional recording studio equipment and modern recording software, Eno noticed how the transparency and immediacy provided by single physical switches for each single function was compromised by “a several-step mental negotiation”<sup>219</sup> involved in traversing software options and menus: “My engineer kept saying ‘Wait a minute’ and then had to duck out of the musical conversation we were having so he could go into secretarial mode to execute complex computer-like operations. It’s as though a new layer of bureaucracy has interposed itself between me and the music we want to make.”<sup>220</sup> Additionally, Eno also notes that this ‘layer of bureaucracy’ has been inserted at the expense of bodily agency:

Years ago I realised that the recording studio was becoming a musical instrument. ... But now I’m struck by the insidious, computer-driven tendency to take things out of the domain of muscular activity and put them into the domain of mental activity. The transfer is not paying off. Sure, muscles are unreliable, but they represent several millions of years of accumulated finesse. Musicians enjoy drawing on that finesse (and audiences respond to its exercise), so when muscular activity is rendered useless, the creative process is frustrated. No wonder artists who can afford the best of anything keep buying ‘retro’ electronics and instruments, and revert to retro media.<sup>221</sup>

The initial promise and potential of the software studio has been deflated somewhat following the identification and understanding of the ways in which software unwittingly alters and imposes a different technical mode of engagement (or ‘revealing’, in Heidegger’s term). In my own experience, the opportunities afforded by software composition are compromised, stifling my compositional creativity to the point where I will happily spend hours procrastinating, tweaking my music on a technical level long after the compositional aspect has been completed. It is becoming increasingly difficult to readjust to a creative, compositional mode once again when I start a new piece of music; once focused in a technical

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<sup>219</sup> Eno Brian, ‘The Revenge of the Intuitive’, *Wired* (January 1999), <[www.wired.com/wired/archive/7.01/eno.html](http://www.wired.com/wired/archive/7.01/eno.html)> (Accessed 14th September 2010).

<sup>220</sup> *Ibid.*

<sup>221</sup> *Ibid.*

mode of engagement, I am reticent to leave it. Moreover, as a pervasive centrepiece to my studio, my computer requires that I spend most of my time in this technical mode.<sup>222</sup>

Eno's comments were made over a decade ago, which in the online computer world, feels like considerably longer. Since then, music software and PC hardware has vastly increased in its power, speed and flexibility, and the decentralised opportunities for online music distribution have exploded. Vast online music communities centring around the tools of music technology now exist,<sup>223</sup> and yet they also appear to vindicate Eno's concerns, fetishising expensive analogue equipment which would seem incredibly inflexible and limited compared to what we can accomplish using software. Electronics of the pre-computer age, such as valve/tube amplifiers, transformers and discrete op-amps are all revered for their supposed 'warmth' and 'tone' compared with equipment borne of modern manufacturing techniques, such as surface-mount integrated circuits or microprocessor-based DSP processors. I have no doubt that part of this reverence can be explained by a romantic 'technostalgia' as Taylor would put it, casting our rose-tinted gazes back to a simpler Golden Age of recording. But there are also significant reasons for opting for these limited pieces of boutique equipment.

Taylor mentions a pertinent quote by Tim Gane, of the band Stereolab, discussing his predilection for vintage analogue equipment: "We use the older effects, they're more direct, more extreme, and they're more like plasticine; you can shape them into loads of things. Modern effects sound blander to me and are less human, more characterless."<sup>224</sup> Taylor suggests that this is an issue of agency, with more tactile and straightforward equipment (whether analogue or digital) affording a greater degree of control. There is no intrinsic reason why vintage equipment should feel any more 'human' than a piece of computer software (or software-driven hardware, such as most modern hardware synthesisers), but the tactile simplicity of a 'one-button-per-function' piece of hardware affords a greater sensory intimacy between operator and machine. In this instance, *techne* stills feels *poietic*, harmonious and intuitive, as its operation has not been abstracted to the realm of technical negotiation, as earlier observed by Eno. Eno sees a design flaw in equating more options with greater

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<sup>222</sup> The recording process traditionally has consisted of very discrete roles, from musician and producer, to recording engineer, mix engineer and mastering engineer. Each role was tailored to a particular mode of engagement, whether creative on the part of musicians and producers, to technical on the part of the aptly-titled engineers. In having to combine and take-on all these roles for oneself in one's home studio, it is no surprise that the differences in these modes of engagement will become apparent.

<sup>223</sup> Such as the aptly-titled *Gearslutz*, featuring input from professionals and enthusiasts at all levels in the music industry.

<sup>224</sup> Taylor, *Strange Sounds*, p. 110.

freedom, purporting the opposite to be true, as “the instruments and tools that endure (because they are loved by their users) have limited options.”<sup>225</sup> Here, single-purpose trumps the multipurpose, as only through the placing of distinct limitations may something be thoroughly mastered, or even creatively subverted; the inflexibility of a physical electronics circuit is balanced by the flexibility of permitting direct creative modifications and alterations.<sup>226</sup> In the case of boutique audio equipment, it is the inherent limitations, flaws and nonlinearities that result in a ‘musical’ sound, due to electric current coursing through inefficient components, producing complex harmonic distortion. The contrasting perfection of software processing can often seem lacking in this respect.<sup>227</sup>

In spending the last ten years or so working inside music sequencers like Cubase, not only have I had my compositional practice reshaped by the Heideggerian Enframing of my virtual compositional palette, I have also willingly delegated part of *techne* over to it (or have perhaps capitulated to amputation). Realistically, these effects cannot be reversed easily; I acknowledge that my skills have grown through the use of my software environments, and accept that this is where my compositional strengths lie. It would be imprudent and pointless for me to simply attempt to withdraw from such a system entirely, serving only as a Luddite denial of the practical knowledge I have developed (recalling Heidegger’s earlier assertion, “[w]e remain unfree and chained to technology, whether we passionately affirm or deny it”).<sup>229</sup> Therefore, rather than retreat, I prefer to understand my engagement and complement it accordingly, despite the inevitable compromise. My intention is not to demonise or offer a pessimistic bias against modern music technology, but to recognise the pragmatic limitations of the software environment and its effects on my creativity; a balance is required. I will accept this delegation of part of my artistic *techne* to my sequencer, yet will seek an alternative means of fulfilling the remaining poetic crafting aspect of *techne*.

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<sup>225</sup> Eno, ‘The Revenge of the Intuitive’, *Wired* (January 1999), <[www.wired.com/wired/archive/7.01/eno.html](http://www.wired.com/wired/archive/7.01/eno.html)> (Accessed 14th September 2010).

<sup>226</sup> As in the case of ‘circuit bending’, a practice of hacking common consumer electronics, altering or inserting circuitry to creatively (and often accidentally) enhance the resulting palette of sounds available.

<sup>227</sup> Software programmers are currently capitalising on the fixation with vintage equipment, marketing their software plugins with visually ‘worn’ interfaces to simulate their hardware counterparts. Indeed, only recently, within the past five years, have audio software developers been tasked with creating exacting software counterparts to specific models of expensive sought-after hardware, resulting in online shootouts between software and hardware.

<sup>229</sup> Heidegger, *The Question Concerning Technology and Other Essays*, p 4.

## Practical Rematerialising (Part B): A Reclamation of *Techné*

Following my research into identifying and assessing the influence of technology in my practice, informed by McLuhan and Heidegger, I set about researching the means to balance my technical software expertise with a more *poietic* crafting. I hoped to achieve auratic restoration not only with the musical end product, but also as an inextricable component of the creative musical process, crafted using a prismatic balance of creative and technical modes. In theory, this would re-establish my practice, locating it more closely to an idealised state of *techné*, in its original meaning of a balanced and harmonious practical application of technique and poietic aesthetics.

I was inspired by composer Nicolas Collins' book, *Handmade Electronic Music*, which resonated with my growing frustrations working within the immaterial software realm. The following playful paragraph from the book's introduction was particularly salient, given my cause:

Computers are wonderful, don't get me wrong, but the usual interface—an ASCII keyboard and a mouse—is awkward, and makes the act of performing a pretty indirect activity, like trying to hug a baby in an incubator. 'Alternative controllers' (such as those made by Donald Buchla and artists working at STEIM) are a step in the right direction, but sometimes it's nice to reach out and *touch* a sound. This book lifts the baby out of the basinet and drops her, naked and gurgling, into your waiting arms, begging to be tickled.<sup>230</sup>

While Collins approaches this problematic disconnection from the perspective of performance, he nevertheless clearly illustrates the difficulty in really feeling part of the music created in such a medium. To be able to transplant the abstraction of software-generated sound and place it in physical space creates a huge scope for crafting and tinkering; this reintroduces a sense of touch and materiality that was precluded by technical modes of engagement, biased, as they are, towards the mental and the visual. What I needed, was to be able to create a simple mechanical machine that could play notes, sequenced from my MIDI music software; rather than rely solely on virtual VST instrument plugins or hardware synthesisers, I would attempt to craft a physical, mechanical MIDI instrument—more of a *poietic plug-in*.

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<sup>230</sup> Collins, Nicolas, *Handmade Electronic Music: The Art of Hardware Hacking* (New York, London: Routledge, 2006), p. xiii.

Mechanical music instruments certainly have a rich history, from player pianos (tested to their limits by composers like Conlon Nancarrow) and barrel organs to more recent experimental instruments and pioneering machines from composer-inventors such as Gerhard Trimpin, and MIT Graduates Dan Paluska and Jeff Lieberman. These instruments often span a variety of aesthetics, from Paluska and Lieberman's impossibly intricate 'Absolut Machines',<sup>231</sup> to the more mysterious mechanisms of Trimpin's 'Sheng High' installation,<sup>232</sup> or his colossal tower of self-playing guitars, 'IF VI WAS IX: Roots and Branches'.<sup>233</sup> Yet in most cases, one can look at these instruments, with their exposed mechanisms, and immediately understand how they work; these instruments present you with the multi-sensory poetic harmony that reveals the essence of their function, evoking a similar sense of simple awe as any well-crafted instrument or artwork. Although very much on a smaller scale than either of these industrial installations, I took steps towards creating my own poetic plug-ins, and documented the process on the following pages.

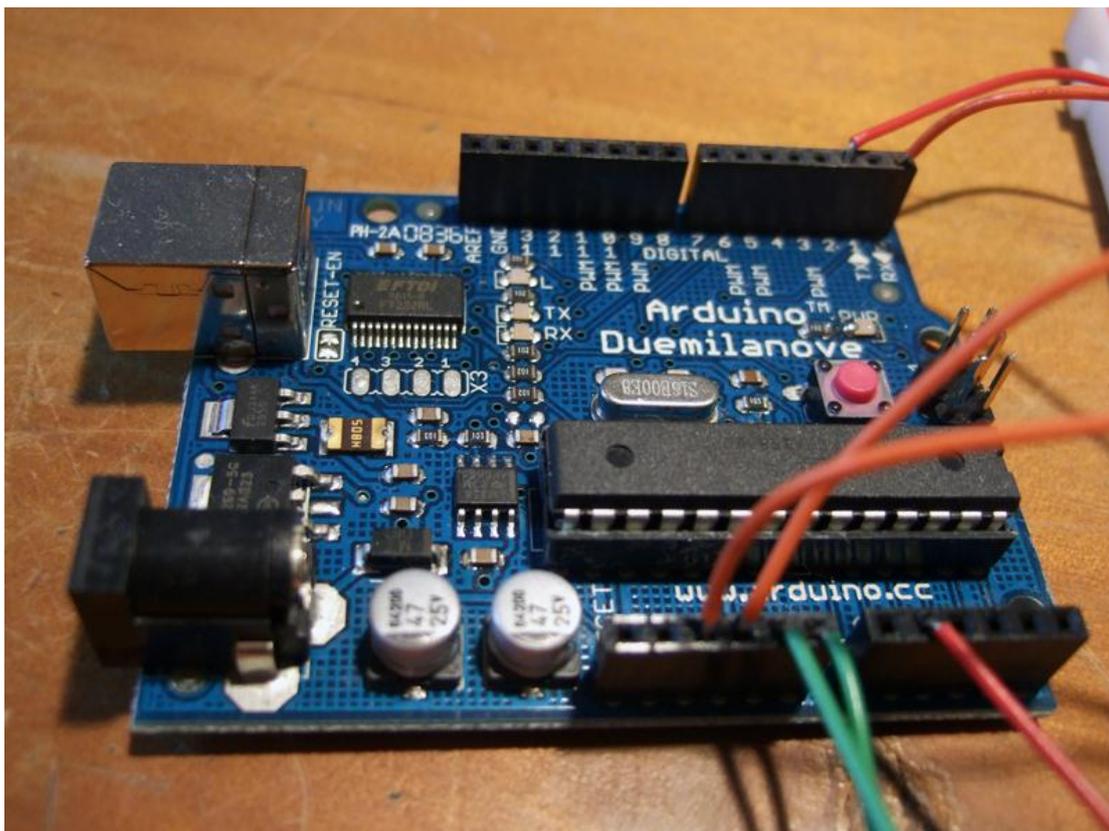
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<sup>231</sup> <<http://www.youtube.com/watch?v=1e9AJVtuCKc>> (Accessed 24th September 2010).

<sup>232</sup> <<http://www.youtube.com/watch?v=kjmeOnyQ5Pk>> (Accessed 24th September 2010).

<sup>233</sup> <<http://www.youtube.com/watch?v=IWF1A181YBs>> (Accessed 24th September 2010).

## B.1 Poietic Plug-Ins



**Figure 14.** The Arduino Duemilanove, with (clockwise from top) output pins, input pins along the bottom, power adapter input, USB serial connection (for transferring programs over to the board). The most notable component on the board is the large ATMega168 microprocessor used for executing the resident program.

Shortly after Christmas 2009, while researching suitable electronics platforms to meet my requirements, I discovered the ‘Arduino’ prototyping system. The platform represents a grassroots ‘physical computing’ movement that aims to unite computer software programming and real-world applications of robotics and craftsmanship.<sup>234</sup> As such, it combines a flexible and affordable microprocessor, capable of addressing a variety of external inputs and outputs, with a software IDE (integrated development environment). The Arduino seemed like a capable method of bridging the gap between physical and virtual realms, being flexible yet relatively affordable.

While waiting for my Arduino ‘Duemilanove’ to arrive (Figure 14, above), I promptly set about researching the feasibility of creating a physical Arduino-based instrument that I could program to receive MIDI from my software sequencer, Cubase, and somehow mechanically trigger corresponding notes. It quickly became clear that the Arduino platform,

<sup>234</sup> <www.arduino.cc> (Accessed 17th September 2010).

due to its incredible flexibility, was adopted by many hobbyists as their prototyping platform of choice. This in itself showcased one of the great advantages to online connectivity: community. The web is peppered with enthusiast sites replete with informative articles and community forums, and the official site naturally collects the best of these documents.

Thanks to the community documentation, I found a schematic that described a method of driving ‘solenoids’.<sup>235</sup> These are small electro-magnetically driven pistons that extend (‘push’ types) or retract (‘pull’) their central shafts when a current is applied, typically used for electronic locks. Solenoids come in a variety of sizes and types, from large, heavy solenoids that work slowly but can exert huge forces, to small solenoids that fire extremely quickly but with little force. I then had the idea of using small solenoids as the mechanical basis for an idiophonic instrument such as a glockenspiel. As a complete electronics novice, the relatively simple mechanism would perhaps be a fitting project to begin with, at this relatively late stage in my research.

Now having an inkling of how to connect and trigger a solenoid, I would need to research the means of wiring up a MIDI input, so that event messages sent by Cubase could be interpreted by the Arduino microprocessor, triggering the correct solenoid for the note received. Sure enough, after a little online hunting, I managed to find a small guide to wiring-up a standards-compliant MIDI input (requiring the use of an ‘opto-isolator’, to electrically decouple the connected MIDI devices).<sup>236</sup> As MIDI is a serial protocol (i.e. only one message can be transmitted at a time), it did not require too much preparation to interface with the Arduino board (as it also uses a serial port for its communication with the IDE software).

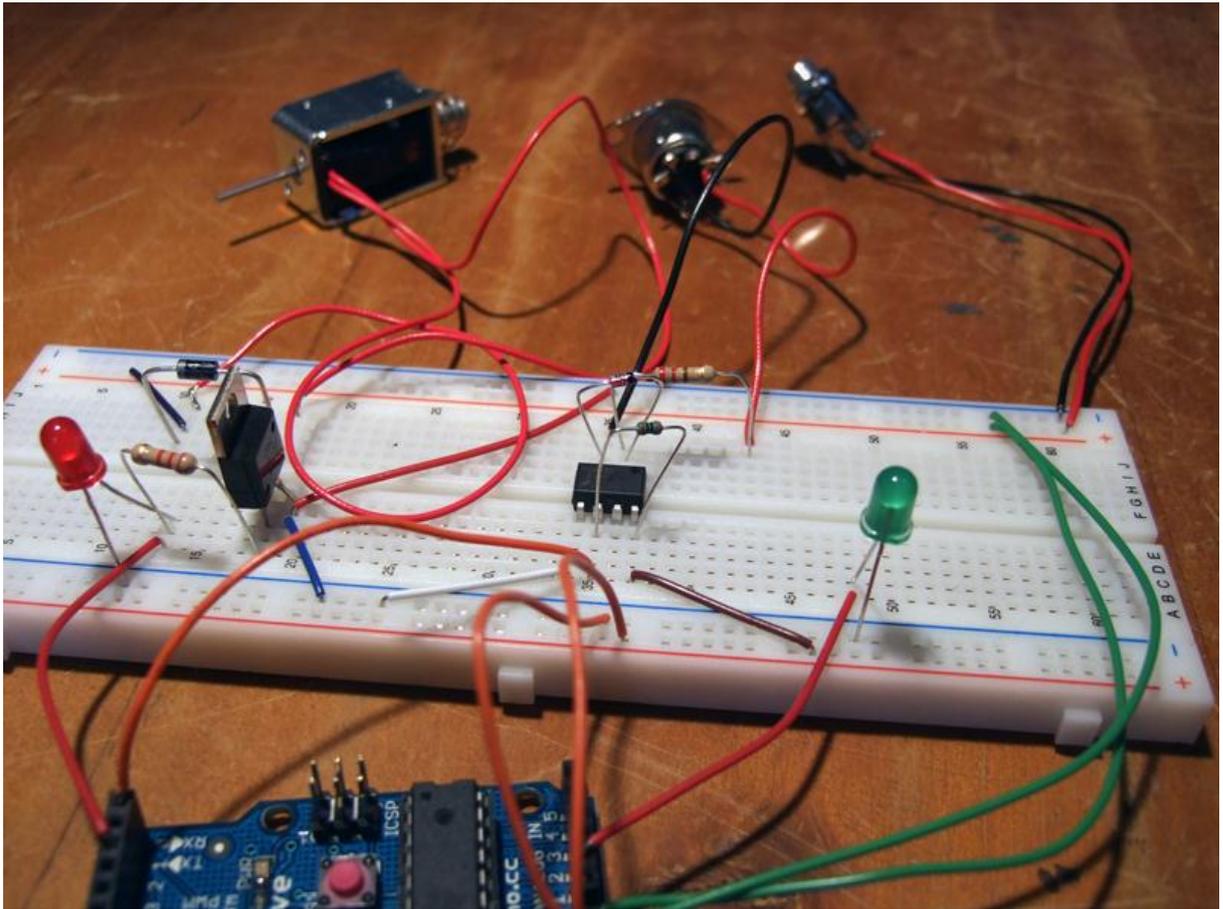
With my shopping list prepared, I ordered the additional components needed to create a small test circuit, to verify that these circuits did indeed work (and that they worked together). While waiting for my components to arrive, I began researching the software side of Arduino, getting to grips with the code language used to write the programs that would run on the microprocessor. With some helpful input from the forum community, I had a barebones program that would trigger an LED on reception of a note-on message. This could then be adapted to drive the solenoid output with a little code shuffling.

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<sup>235</sup> This pdf document illustrates how to correctly drive a solenoid:  
<[www.arduino.cc/playground/uploads/Learning/solenoid\\_driver.pdf](http://www.arduino.cc/playground/uploads/Learning/solenoid_driver.pdf)> (Accessed 22nd September 2010).

<sup>236</sup> <[www.tigoe.net/pcomp/code/communication/midi](http://www.tigoe.net/pcomp/code/communication/midi)> (Accessed 22nd September 2010).

## B.2 Prototyping



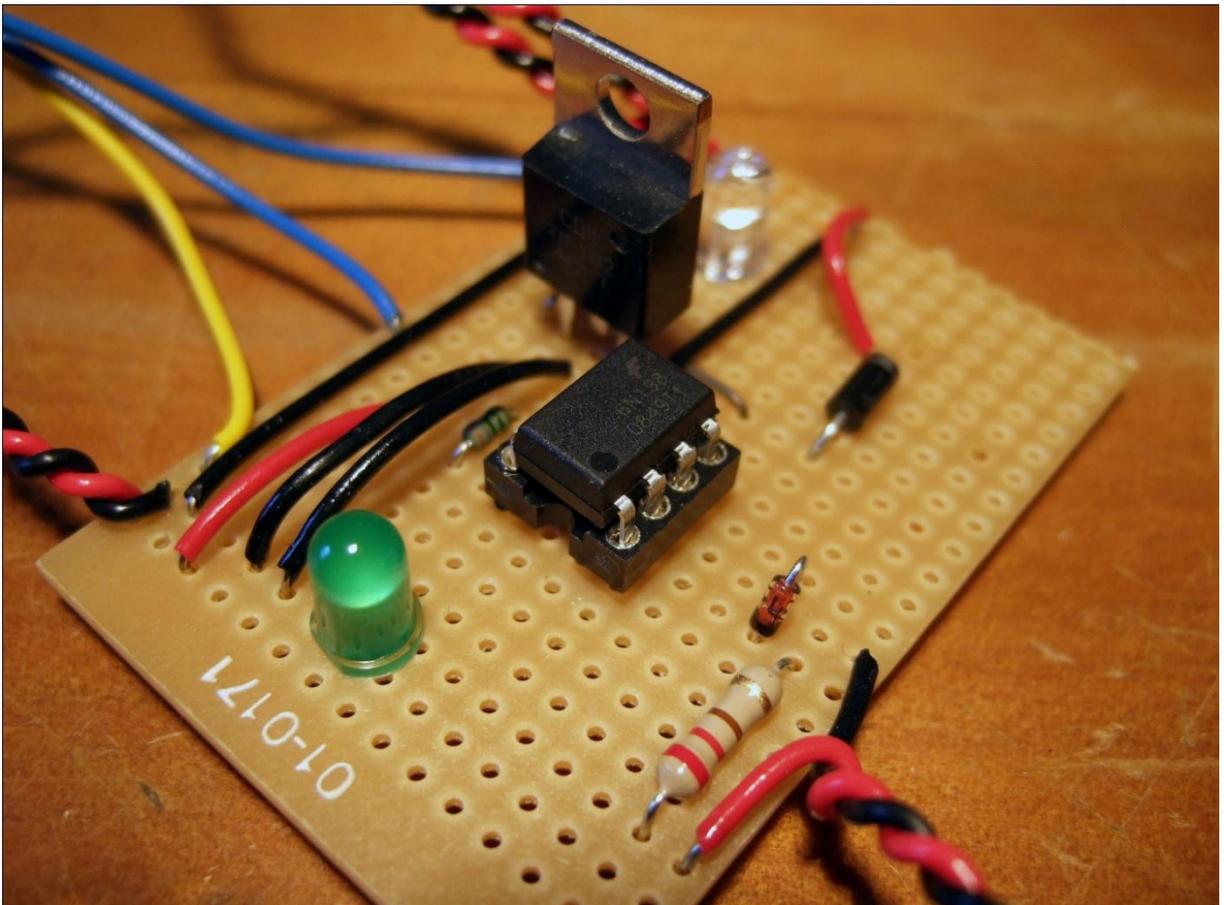
*Figure 15. A working prototype, constructed on a temporary breadboard.*

With all my components finally at hand, I set about constructing my prototype using a small ‘breadboard’, allowing me to quickly create circuits simply by pushing component pins and wires into sprung terminals, without the need for soldering.

I developed a working breadboard prototype (Figure 15, above) which takes a single MIDI input, interprets the MIDI data to send a note-on message to a corresponding Arduino pin output for the note, which then triggers a solenoid for a set period of time, before deactivating. With the basic circuit finalised, complete and working, I removed the MIDI circuitry from the breadboard and soldered it to stripboard, resulting in a more robust, permanent circuit (Figure 16). I now needed to purchase the necessary glockenspiel to be adapted for mechanical performance, as well as the additional solenoids and components. Furthermore, I would have to refine the programming code, tightening it up considerably to be as efficient as possible.

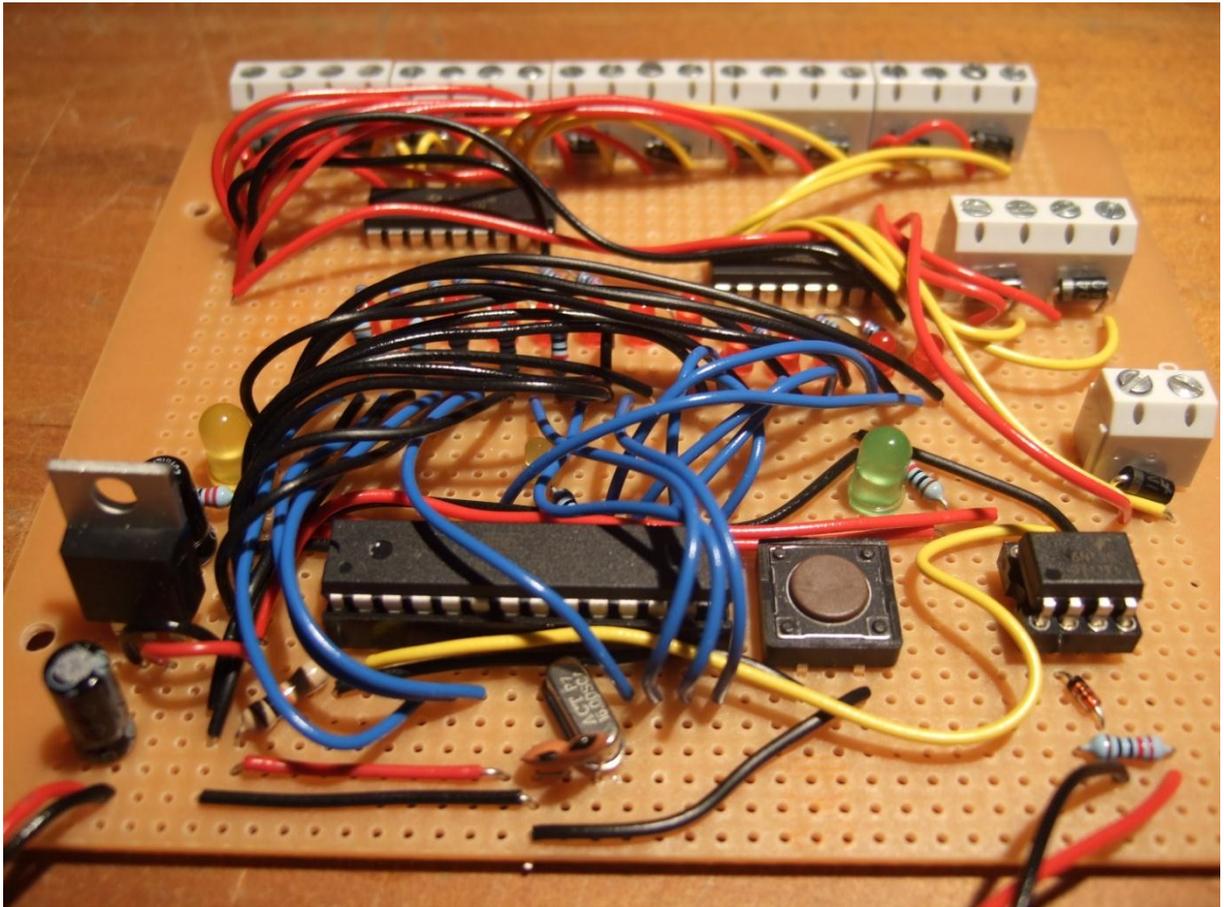
At this stage, my wish to reintroduce a crafting element to my practice seemed distant; deciphering schematics, constructing circuits and writing computer code, only served to

remind me of the technical nature of such practices, evoking Heidegger's Enframing. Yet these stages were a necessary compromise if I was to fully realise my wishes of crafting physical instruments that would, to borrow Collins' phrase, allow me to 'reach out and touch sound'. I comforted myself knowing that I could adapt the existing circuitry and programming framework to create a variety of different instruments. This preparation would stand me in good stead when it came to expanding my imagined arsenal of Poietic Plugins, yet I was also rapidly becoming aware of how much this technical activity was further expending time that could be used composing music.



**Figure 16.** The prototype daughterboard. More permanent than the breadboard, it still required interfacing with the Arduino board. MIDI input at the bottom-right, power and serial communication at the top-left edge, and solenoid output at the top, behind the (somewhat over-specified) TIP102 transistor driver. The central 6N138 opto-isolator chip ensures electrical isolation between the MIDI input and the remaining circuitry.

### B.3 Circuitry and Carpentry



*Figure 17. The complete self-contained circuitry, combining the MIDI input (bottom-left), core processing circuitry, solenoid transistor driver arrays (top) and 13 grey solenoid output terminals (top, top-right).*

Pleased that the code performed as it should, and now furnished with the necessary components to realise my mechanical idiophone, I decided to purchase a small glockenspiel as the basis for my instrument. Mechanically simple, the glockenspiel would provide a good basic foundation for my initial instrument, and as the solenoids would strike the keys directly, it posed a minimum of mechanical issues and potential complications.

Rather than use the Arduino circuit board, plus a separate board for the MIDI and solenoid driver circuits (as in Figure 16), I decided to replicate the Arduino board completely, (Figure 17) without the unnecessary additions such as the USB port. I did not require a direct computer interface with the programming IDE; I could simply load the program into the processor chip using the main Arduino board, then unplug the chip and slot it into a socket on my instrument. This kept extraneous circuitry and components to a minimum, streamlining the circuit design and keeping the board size down.

Using an online guide,<sup>237</sup> I duplicated the core components from the Arduino board on a small section of stripboard, which allows for components to be soldered in place permanently, providing parallel conductive tracks on the underside of the board to automatically join components situated on the same track. The main components I needed to duplicate were the filtered power supply, accepting a 2.5mm barrel power plug, the timing crystal, a reset switch, and of course the ATmega168 microprocessor, to run the program and address the MIDI inputs and solenoid outputs.

Next to the core processing circuitry, I soldered the components that comprised the MIDI input circuit and the solenoid driver circuitry, which included two ULN2803AN transistor arrays, each effectively containing eight transistors, to cover the needs of an inclusive chromatic octave of notes, i.e. thirteen outputs. Using these transistor arrays rather than individual transistors (such as the functional, but over-specified TIP102 I used on the breadboard and daughterboard prototypes) saved a lot of space, requiring just a single ground terminal per array.

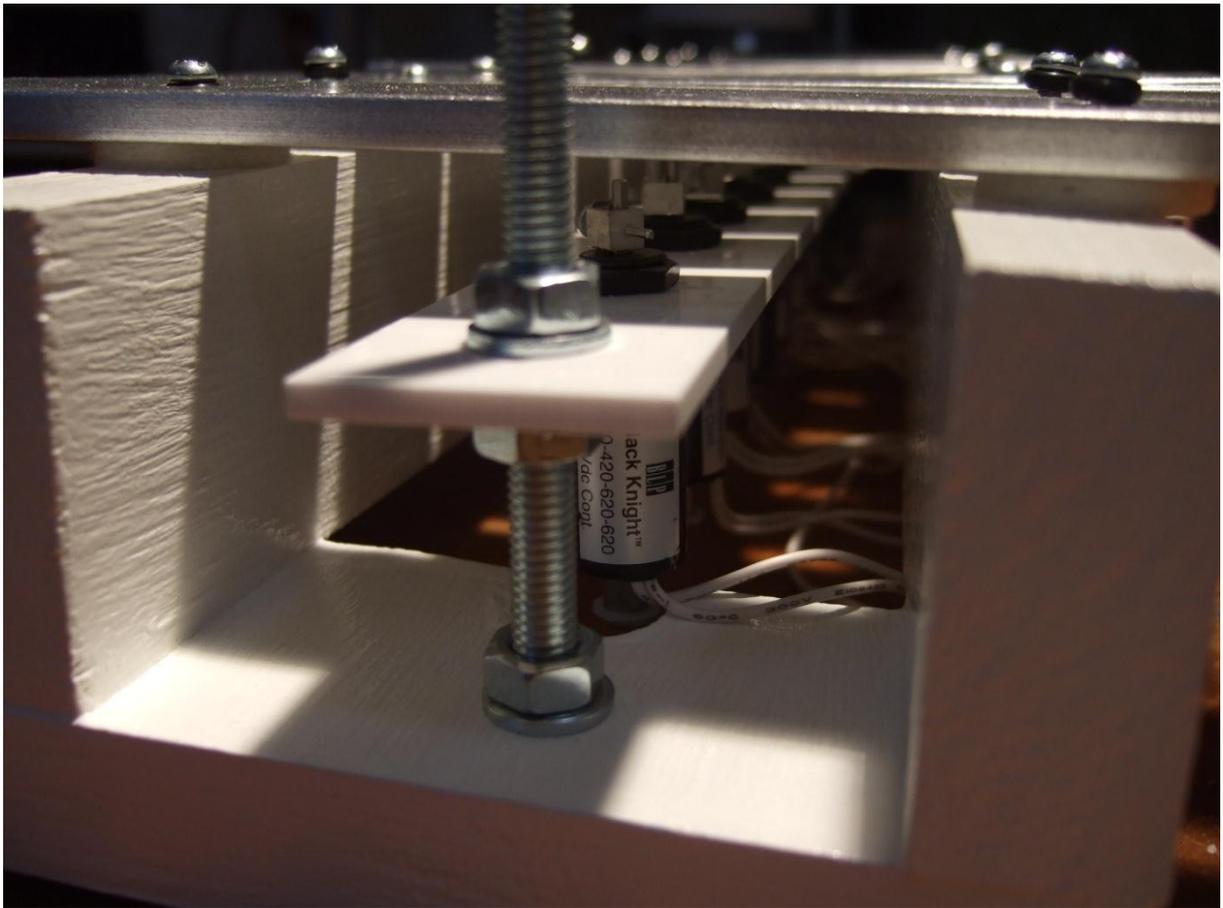


*Figure 18. The basic frame for the glockenspiel.*

With the electronics and software complete, I began crafting the wooden frame of the instrument (Figure 18) that would accommodate the solenoids beneath the keys (as the original frame supplied for the glockenspiel was too low), and so started removing the keys from the shop-bought glockenspiel, ready to be transplanted onto the new frame. Once I had crafted a frame I was happy with, I gave it a coat of white paint, before devising a height-adjustable caddy that would accommodate the solenoids. As wood would be too thick to allow me to use the threaded nuts on the metal solenoids, I decided to use a small strip of 3mm-thick acrylic instead, and ordered a few custom-sized strips, ready to be drilled to accommodate the threaded solenoids.

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<sup>237</sup> <<http://itp.nyu.edu/physcomp/Tutorials/ArduinoBreadboard>> (Accessed 23rd September 2010).

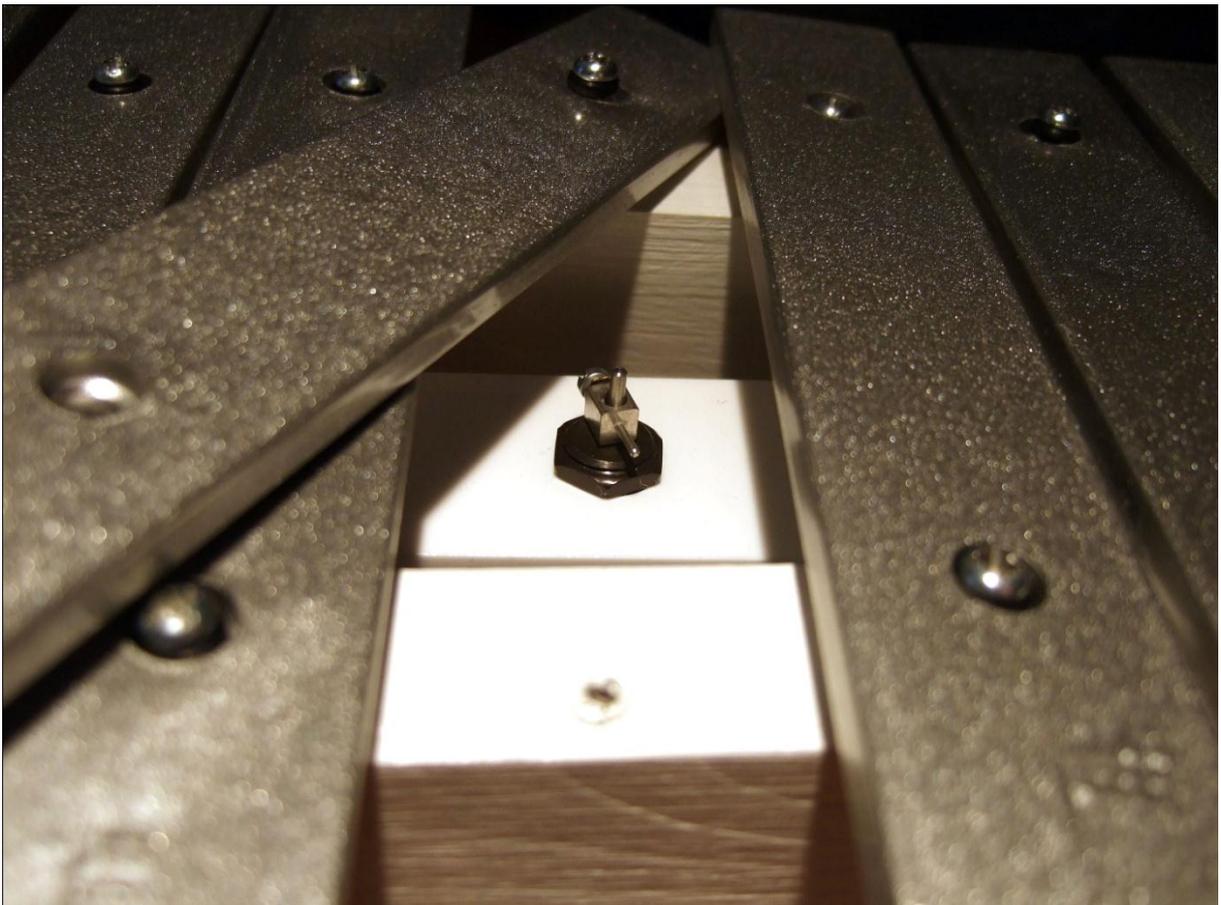


*Figure 19. A close-up showing the adjustable acrylic support bar, accommodating the threaded solenoids.*

Once assembled, I then had to test the striking action of each solenoid, ensuring a clean strike that rang the note soundly without choking it. I had programmed each note to strike for a set duration (20 milliseconds), regardless of how long the MIDI note was, ensuring a consistent strike each time. The down side to this, was that every note was also of a uniform force, regardless of the incoming MIDI note velocity. Given the use of digital output pins on the Arduino, I could not figure out a way to create a smoothly ramped strike, according to the velocity; the notes were either on or off. The adjustable nature of the acrylic support (Figure 19) meant I could test the lowest note, adjusting the distance from the steel key as necessary, then test the highest note, and once an acceptable striking action was achieved all the notes in between should, in theory, follow suit. However, I had not accounted for the added weight of the solenoids once the support bar was fully loaded, and so consequently the bar bowed slightly in the centre. Tying a support strut solved this problem, but in future iterations of the instrument I will consider alternative materials (an aluminium ‘U’-shaped channel would be ideal, offering rigidity and low weight).

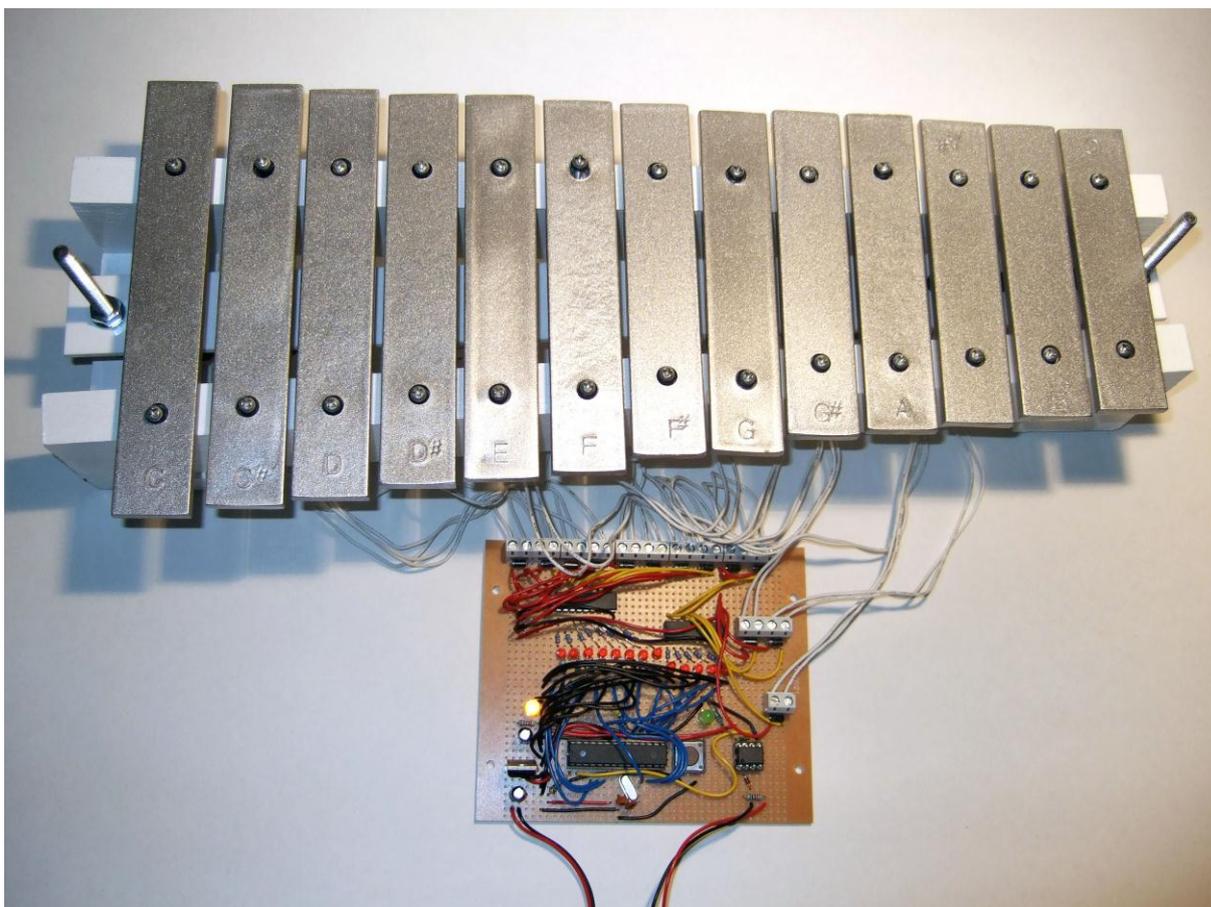
One final issue was the solenoids themselves, which did not have a means of securing the central plungers. As they are oriented vertically when loaded into the glockenspiel, the

plungers would simply fall out under gravity. I found that using some spare screw terminals clamped down over the end of the plunger, acted as sufficient catches to keep the plunger from falling out. I initially wondered if the extra weight added by the screw terminals altered the action of the solenoids, but thankfully it did not appear to appreciably effect the striking response.



*Figure 20. One key removed, revealing the end of a solenoid plunger, secured with a screw terminal to prevent it falling out under gravity.*

#### B.4 The ‘Poietic Plug-In’ Glockenspiel [ref. included media: CDR tracks 6-8, and DVD title 2]

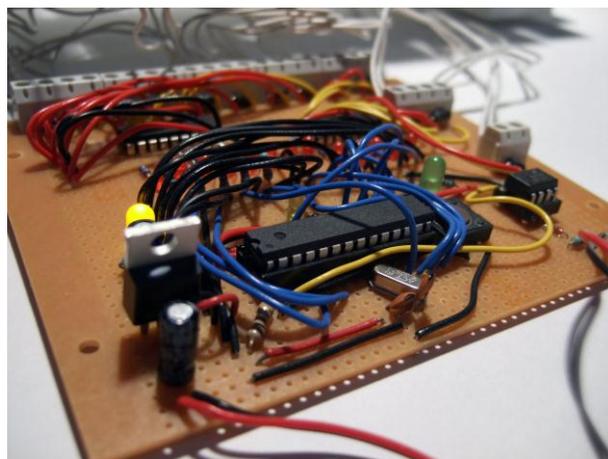


**Figure 21.** The complete ‘Poietic Plug-In’ Glockenspiel, with a 12V power supply input on the left, and MIDI input on the right.

Finally complete (Figure 21), I could now enjoy using my mechanical MIDI glockenspiel in my music. Witnessing a physical instrument playing in front of me, performing MIDI sequences programmed into Cubase, is an enjoyably bizarre spectacle. The process of building the instrument was in itself hugely satisfying, and now opens up the possibility of creating physical ensembles of ‘Poietic Plug-ins’, to either perform pieces in the studio, or as part of installation-based performances. Indeed, while the purpose of my research was focused primarily on the process of rematerialising my creative practice, as well as crafting a permanent instrument, there is undoubtedly potential for creating performances. I plan to experiment further with the materiality of the instrument, ‘preparing’ the surface to affect the timbre and tone of the notes, and capping the solenoids with different materials to change the tone.

The creation of such instruments also raises the possibility for further development of the site-specific aurality explored by *Reception*, providing opportunities for unique

installations and performances. Artist and musician David Byrne, formerly of the new wave band Talking Heads, used a similar technology with his 'Playing the Building' installation, whereby an old pump organ was used to trigger solenoids, motors and air pumps connected to the structure of various buildings, effectively turning the whole building into an instrument.<sup>238</sup> However, Byrne's installation was premised on extending the physical instrument of the pump organ to the materiality of building itself, and is played by members of the public striking the keys directly. My Poietic Plug-in, on the other hand, represents a means of extricating my sequenced music from the immaterial digital domain of the software sequencer; physically realised in the material world, yet still connected to, and accessible from, the software realm.



*Figure 22. Complete and operational.*

Of course, there are still a number of hurdles to overcome in order to implement a performance-ready instrument. The means to store MIDI sequences onboard, in addition to accepting MIDI input, would prove a huge advantage, negating the need for a laptop or computer. This would greatly increase the portability of the instrument, although to be fully portable it would require a considerable twelve-volt battery source, which I have not been able to implement yet. I am also unsure just how long such a power source would last, firing all these solenoids; perhaps the ability to charge the battery with a small solar panel would be feasible. Being able to encase the circuitry within the instrument is also a necessity that needs to be addressed. All these practical considerations are exciting for me, and are borne entirely out of the limitations faced by the process of rematerialising instruments.

Compositionally, the limitations imposed by the physical instrument force me to shape my creative process accordingly; during testing, I initially found myself often running out of notes when writing melodies, falling outside the octave offered. This served to reign in my usual tendencies to make the most of the near limitless polyphony of virtual instruments, with wide chords, instead focusing on the timbre of the instrument. Unlike sampled instruments, no two notes will sound exactly alike, allowing me to multitrack the same melody and pan each

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<sup>238</sup> <[http://www.davidbyrne.com/art/art\\_projects/playing\\_the\\_building/](http://www.davidbyrne.com/art/art_projects/playing_the_building/)> (Accessed 25th September 2010).

channel across the soundstage to achieve a natural chorus effect, making this diminutive, simple glockenspiel sound much larger. I have found that this effect works particularly well with prepared keys, such as placing coins across the top of the notes [ref. CDR track 8, DVD title 2]. As this instrument is played from beneath, I am free to place various objects on the top to rattle and vibrate sympathetically, or alternatively dampen the tone. Indeed, even the simplistic timbre of the glockenspiel, replete with the clattering of solenoids, makes for a welcome contrast to the pure (or sterile) realm of software synthesis. Simply setting up a microphone to record the glockenspiel from different angles results in a different tone—a different amount of ‘air’ and ‘room’ that is missing from the clinical synth-based music I usually compose.

Now that the groundwork has been laid, I hope to move on to more complex and interesting instruments. Although, this project has been a great way for me to understand what is possible with something as relatively accessible as Arduino, plus some basic electronics, I still feel I have much to learn. Nevertheless, I hope to be able to craft more instruments in order to create a small ensemble of various plucking, striking, scratching and thumping instruments. In this respect, my journey from a computer musician to a tinkering craftsman, documented over the course of this thesis, is a small leg of a potentially much larger journey.

## Chapter 5. Platonic Origins: Faith of the Techno-Romantic

For the final chapter of this thesis, I wish to probe further into nature of techno-romanticism, to explore and reveal the roots to our modern predilection for regarding technology as a means for emancipation or empowerment, and examine the implications of taking these standpoints to their extremes. Given Heidegger's illustration of how the two vital components of *techne*, i.e. an artistic crafting plus a technical understanding, became divorced as a result of increasing technological mastery, it would now be useful to investigate how such a division relates to our modern propensity for quixotic proclamations of techno-romanticism (such as the position promoted in Attali's phase of Composing). As Heidegger places the root of this division with the ancient Greeks, it would be fruitful to use the surrounding mythology as a means of uncovering a link with our modern technological attitudes, as well as drawing parallels between modern information technology and the *techne* of writing.

As Heidegger and McLuhan warned, when seduced by the apparent myriad possibilities of augmentation and extension, the techno-romantic will be blinded to the risks of amputation; moreover, Erik Davis contends that this technical outlook is enforced by an almost faith-like verve. Davis suggests this techno-romantic utopianism stems from a variety of "mystical impulses that continue to spark and sustain the Western world's obsession with technology, and especially the technology of communication".<sup>239</sup> Within the context of music, this appears to have less to do with the future of music production and listening, and more about fulfilling the quasi-spiritual fantasies of today's technological proselytisers.

One prime example of this theologically-infused futurism is the idea of the 'Celestial Jukebox', as mentioned by Paul Goldstein,<sup>240</sup> or the more recent development of the term 'Cloud Computing', to denote remote application use and remote data storage/retrieval. Goldstein admits the 'celestial' term is metaphoric, as it is more practical and likely to exist as a web server, set up in the decidedly unromantic data storage centre within a nondescript industrial park, than an orbiting satellite. Yet he is clearly moved by the romantic connotations conjured up by a heavenly (and thereby implicitly dematerialised, as post-corporeal) stronghold of information, bestowing all the music we could wish for upon our playback devices.<sup>241</sup> For me, this is another reason to be cautious, as behind the transcendental

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<sup>239</sup> Davis, Erik, *TechGnosis* (Serpent's Tail 2004), p. 5.

<sup>240</sup> Auslander, *Looking at Records, The Drama Review*, p. 77.

<sup>241</sup> No doubt mobile devices, as is the current industry's fascination with mobile technology, part of a futurist

imagery we have effectively relinquished control of our information, data, music collections etc., to the companies' operating our cloud services.<sup>242</sup> It is a worrying aftertaste as part of our personal mobile empowerment, which can easily also be read as another facet of technology's symptom of social alienation through simulacra, as users 'connect' through these 'social' portals via mobile technology. Typically, these concerns are easily masked by the tantalizing tropes commonly encountered among the techno-romantic, such as the animistic, transcendental dichotomies of offline/analogue/corporeality and online/digital/spirit-soul.

Davis locates the twin themes of spirit and soul as central to our rejuvenated technomysticism, as separate but intertwined core threads, enhanced and elucidated by our technological media catalysts. "By soul, I basically mean the creative imagination, that aspect of our psyches that perceives the world as an animated field of powers and images. ... Spirit is an altogether different bird: an impersonal, incorporeal spark that seeks clarity, essence, and a blast of the absolute."<sup>243</sup> To reframe with the web in mind, regarding our online and offline selves, if our soul lies at the nucleus of our corporeality, in command of our minds and bodies, our spirit lies online with our avatars, aliases and alter-egos, as they interact with those of other users. Although this will undoubtedly initially appear far-fetched, in understanding the animistic *techne* of the written word, and its subsequent online digital simulacra, it will seem logical to imagine an online unification of the soul and spirit, akin to one of William Gibson's 'Neuromancers'.

Davis argues that this 'technomysticism' originates from Greek mythology, specifically the messenger god, Hermes, about whom the initial strands of magic, media and the mind were interwoven. Wearing wing-tipped sandals, acting as mediator of gods and man

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strain concerned with a new age of nomadism, incidentally mentioned by Attali, emboldened since the advent of the Walkman, and more recently the iPod and smart phone.

<sup>242</sup> Take, for example, the online community MySpace, which became the first port of call for anyone wishing to sample an artist's music from 2004 onwards. Eager to capitalise on such a large portion of the youth market, the site was bought in 2005 by Rupert Murdoch's News Corporation media conglomerate for \$580m. Until 2006, MySpace's terms of use stated that any content uploaded to the site was effectively granting MySpace a license to reuse user content without remunerating its users; English musician Billy Bragg consequently spearheaded a protest campaign to have the terms of use re-written. See <<http://news.bbc.co.uk/1/hi/entertainment/6148654.stm>> (Accessed 14th September 2010). In the past three years, MySpace's popularity has diminished considerably, eclipsed by Facebook as the default 'social networking' website. Facebook has enjoyed a consistent rise in popularity despite being periodically dogged by privacy concerns, most recently in response to the implementation of their 'places' user location-tracking facility. Currently valued at around \$33B, Facebook appears to sustain the online corporate model set by MySpace, leveraging Long Tail economics of unitary insignificance, but great aggregative value. Whether music (MySpace), personal information (Facebook), or video (YouTube), these websites' swollen valuations rely on treating users as Heideggerian 'standing reserve', to be mined for financial gain without remuneration. Also central to these models are pervasive advertising, led by the search giant Google.

<sup>243</sup> Davis, *TechGnosis*, p. 9.

as well as a ‘psychopomp’, guiding souls between the land of the living and the afterlife, Hermes is particularly well-suited as a mythic encapsulation of the web: “Indeed, with his mischievous combination of speed, trickery, and profitable mediation, he can almost be seen as the archaic mascot of the information age. ... Hermes rules the trans-temporal world of information exchange that you and I are participating in right now, myself as I tap out these pixelated fonts and you as you absorb their printed twins through your eyeballs and into your brain.”<sup>244</sup>

But, according to Davis, it wasn’t until the Greek Hermes was filtered through Egyptian mythology, alloyed with the Egyptian scribal god Thoth, that we could witness the predication of modern *techne*, from which our view of technological progress and civilisation arc towards our utopian ideals. Emerging from the Hellenistic theological and technological melting pot of Alexandria, this rebranded Hermes ‘Trismegistus’ (or ‘thrice-great’) served as the source of a host of neoplatonic writings. Although considered a divine entity, Trismegistus was also often portrayed as an ingenious engineer, attributed with the invention of writing and music by Greek historian Hecateus of Abdera, while also credited by Artapan as the inventor of water pumps and stone-lifting machines.<sup>245</sup>

An account of one of Trismegistus’ utopian civic visions in the medieval Arabic tome, the *Picatrix*, details how he creates mechanisms for regulating the Nile against tidal fluctuations. Additionally, Trismegistus creates a city around a temple featuring animal images set into each of four walls, with each animal symbol imbued with benevolent spirits who can speak to the city’s inhabitants. Through carefully placed engravings situated around the city, the whole populace would be made “virtuous and withdrawn from all wickedness and harm”.<sup>246</sup>

Here we witness a utopian vision of a city taming and regulating the Nile with a practical technology, as well as regulating the well-being of its population through the use of a magical “symbolic technology”.<sup>247</sup> Davis continues: “The *Picatrix* reminds us that utopian thought is technological from the beginning. Trismegistus’ magic kingdom is a perfectly designed cybernetic environment, whose feedback mechanisms automatically amplify human virtue even as they dampen human wickedness.”<sup>248</sup> However, on the other hand, the watchful

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<sup>244</sup> Davis, *TechGnosis*, p. 19.

<sup>245</sup> *Ibid.*, p. 27.

<sup>246</sup> *Ibid.*, p. 28.

<sup>247</sup> *Ibid.*

<sup>248</sup> *Ibid.*, p. 29.

eyes of Trismegistus' City spirits cast over his city's population also anticipates a surveillance state, reminiscent of Orwell's totalitarian *1984*. Nevertheless, this Platonic utopian vision of technological, mystical and symbolic mastery working hand-in-hand is a prime example of the kind of idealistic social engineering that would continue to influence technocratic cities through to the modern day.<sup>249</sup>

Writing, as the medium through which this techno-romanticism is initially disseminated, is itself not free from animism, despite being considered a quintessentially modern information technology—an axiomatic cornerstone of education. In Plato's *Phaedrus*, on broaching the topic of writing, Socrates introduces us to the tale of Theuth (a crystallisation of the mythic Hermes/Thoth chimera that would eventually develop into Trismegistus), who offers the *techne* of writing to the Egyptian King Thamus, claiming it will "make the Egyptians wise and give them better memories; it is a specific both for the memory and for the wit."<sup>250</sup> Thamus replies:

O most ingenious Theuth, the parent and inventor of an art is not always the best judge of the utility or inutility of his own inventions to the users of them. And in this instance, you who are the father of letters, from a paternal love of your own children have been led to attribute to them a quality which they cannot have; for this discovery of yours will create forgetfulness in the learners' souls, because they will not use their memories; they will trust to the external written characters and not remember of themselves. The specific which you have discovered is an aid not to memory, but to reminiscence, and you give your disciples not truth, but only the semblance of truth.<sup>251</sup>

Socrates' phonocentric tale of Theuth and Thamus is a classic example of understanding technological determinism,<sup>252</sup> albeit a more extreme example; Thamus rejects Theuth's gift on the grounds of its amputating properties, without considering its augmenting possibilities, and profoundly positive democratising effects. It is all the more rare an example precisely because of its focus on the amputating; Thamus does not become starry-eyed, seduced by the idealistic

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<sup>249</sup> Notable recent examples include the early twentieth century 'Garden City' movement, founded by Sir Ebenezer Howard, resulting in the creation of Letchworth and Welwyn 'Garden Cities'. Such developments would influence the planning and development of modern cities such as Milton Keynes, as well as inspiring unrealised concepts such as Walt Disney's EPCOT (Experimental Prototype Community of Tomorrow). The Italian-American architect, Paolo Soleri, conceived of high-density urban structures he named *arcologies* (a portmanteau of Architecture and Ecology), employing cutting-edge technologies, modern building materials and the efficient use of energy and resources, in order to accommodate vast populations with minimal environmental impact. Due to their technocentric nature, arcologies often feature in science fiction, most notably in William Gibson's 'Sprawl' trilogy (of which *Neuromancer* is included), as well as Isaac Asimov's *Foundation* series.

<sup>250</sup> Plato, *Phaedrus* (1st World Library, 2008), p. 117.

<sup>251</sup> *Ibid.*, pp. 117-118.

<sup>252</sup> This popular tale is quoted not only by Davis, but also by cultural critic Neil Postman and Professor Richard Coyne, as a watershed moment illustrating the transformative characteristics of *techne*.

possibilities of writing and the dissemination of knowledge, nor is he flattered by the prospect that the people of Egypt will no doubt praise him for this gift. As King, dependent on oratorical proficiency, Thamus (like Socrates) sees writing as a secondary technology, merely supplemental to the primacy of speech; writing would exist to record his authoritative dictation. Thamus also saw the written word, as a ‘child’ of Theuth the messenger, as similarly ineffectual, serving as a conveyance of shallow knowledge; Theuth carried the word of Gods, but did not create or produce these words, thus writing is deemed a subservient ‘child’ (a bastard son at that)<sup>254</sup> to its authoritative, paternal spoken word.

Thamus feared, as Davis puts it, “that writing would erode the oral context of education and learning, allowing knowledge to escape from the teacher-student relationship and pass into the hands of the unprepared. Consumers of books would then ape the wise, presenting a superficial counterfeit of knowledge rather than the real deal.”<sup>255</sup> Free from the orator’s guidance and control, writing allows information to extend its reach far further than ever before, through both time and space, to a greater number of individuals. However, writing is also free to be interpreted and misinterpreted, which also then extends its reach.

It is highly unlikely that the bizarre irony of reading Socrates’ phonocentric censure of writing in Plato’s texts will have passed unnoticed. Yet given our nature as a literate culture, it is perhaps prudent to assume that any changes we will have endured through the absorption of the *techne* of *logos* will remain unknown to us. Again, we will proclaim that writing has immeasurably enriched and augmented our lives, our cultures and societies, remaining ignorant of any amputation precisely because of this augmentative transformation.

Jacques Derrida explores this Socratic exposition of speech against the written word, *logos*, in *Dissemination*, and it is through revisiting these Greek terms we encountered earlier with Heidegger, that Derrida chooses to weigh up the case of *techne* and its instrumentality, or lack thereof, in the discovery of *aletheia* (which we recall as from Heidegger as ‘truth’). Derrida defines *teche* as “an art capable of engendering, producing, bringing-forth: the clear, the sure, the secure (*saphes kai bebaion*). That is, the *aletheia* of the *eidos*, the truth of being in its figure, its ‘idea’, its nonsensible visibility, its intelligible invisibility. The truth of what is: writing literally hasn’t a damn sight to do with it.”<sup>256</sup> Derrida, at least at first, appears to stress Thamus’ point that writing conveys the sign of knowledge, not the knowledge itself, and thus as a mere messenger of signification risks a useless impotency to anyone not already

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<sup>254</sup> Plato, *Phaedrus*, p. 16.

<sup>255</sup> Davis, *TechGnosis*, p. 29.

<sup>256</sup> Derrida, Jacques, *Dissemination* (Continuum, 1981) p. 135.

familiar with the signified truth. Derrida sets up these differences in now-familiar terms following my examination of Attali in chapter one: “*mneme/hupomnesis*, the subtle difference between knowledge as memory and non-knowledge as remembrance, between two forms and two moments of repetition: a repetition of truth (*aletheia*) which presents and exposes the *eidos*; and a repetition of death and oblivion (*lethe*) which veils and skews because it does not present the *eidos* but re-presents a presentation, repeats a repetition.”<sup>257</sup>

However, we should be wary of assuming that Derrida also attributes a primacy to speech. Neither an advocate of phonocentrism or logocentrism, Derrida argues that the primacy of the spoken word is ultimately undermined by writing; speech is just as dependent upon writing, as writing is a technical subservience to speech. Derrida exemplifies his methods of deconstruction in illustrating this point, appropriating the word ‘supplement’ from romanticist Jean-Jacques Rousseau, who, in a phonocentric decrying of the written word, states: “[l]anguages are made to be spoken, writing only serves as a supplement to speech.”<sup>258</sup> As Jonathan Culler explains, a dictionary definition of ‘supplement’ is “something that completes or makes an addition”,<sup>259</sup> with the inference here that speech must therefore be incomplete to require supplemental writing (Culler reminds us that a supplement *to* a dictionary contains words missing from it). Derrida’s concept of the ‘supplement’, therefore “harbors within it two significations whose cohabitation is as strange as is necessary.”<sup>260</sup> Culler succinctly clarifies this dual meaning: the supplement is both “an inessential extra, added to something complete in itself, but the supplement is [also] added in order to complete, to compensate for a lack in what was supposed to be complete in itself.”<sup>261</sup> Derrida contends that Rousseau overlooks this second meaning and its implications, revealing shaky assumptions about writing as a supplemental technique.

Moving away from this contested issue of primacy, Derrida’s elucidation of *techne* is reminiscent of Heidegger’s illustration of a perverting role of technology in the ‘poetic revealing’ of *aletheia*; that the deployment of technology taints subsequent modes of revealing to be only technical in nature. An inaccurate codification of alethic signification in writing will therefore result in a repetition of misunderstanding. Falsehood, as well as truth, is perpetuated by writing, disunited from the mind of the writer, and therefore absently

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<sup>257</sup> Derrida, Jacques, *Dissemination*, p. 135.

<sup>258</sup> Rousseau, Jean-Jacques in Derrida, Jacques, *Of Grammatology* (Baltimore and London: The John Hopkins University Press, 1997), p. 144.

<sup>259</sup> Culler, Jonathan, *On Deconstruction* (London: Routledge, 1983), p. 102.

<sup>260</sup> Derrida, *Of Grammatology*, p. 144.

<sup>261</sup> Culler, *On Deconstruction*, p. 103.

impervious and oblivious to immediate refutation. Yet, while *mneme* is hardly itself infallible, it does not rely on external *hupomnemata* (writing notes) or signification; the danger in introducing *hupomnesis*, is its effect on not only the accuracy of the *mneme* in question, but how it affects the way in which we create and store subsequent *mnemes*. Walter Ong notes, in *Orality and Literacy*, that mnemotechnologies have been used throughout the ages, whether a row of pebbles, a notched stick or some other tallying aid.<sup>262</sup> But like a piece of string tied to one's finger while one sleeps, these *aides-memoire* do not in themselves carry intrinsic meaning; there are but prompts for a meaning already understood. Such aids are akin to Heidegger's windmill, functioning harmoniously without the potentially destructive corruptibility of misinterpretation. Writing is Heidegger's 'enframing' hydroelectric dam, not merely enhancing or augmenting speech, but transforming and restructuring it, homogenised by these new technical modes of revealing, as it shifts speech from the oral to the visual, permanently transforming both speech and thought as well.<sup>263</sup>

Davis elucidates this concern, reminding us that writing is a technology we have so thoroughly absorbed "that it is extremely tough to figure out where writing stops and the mind itself begins."<sup>264</sup> Ong also states that "[w]ithout writing, the literate mind would not and could not think as it does, not only when engaged in writing but normally even when it is composing its thought in oral form. More than any other single invention, writing has transformed human consciousness."<sup>265</sup>

Given Socrates' understanding of just how the human mind could be permanently transformed by a *techne* such as writing and the alphabet, it is surprising to imagine complex modern technology still only as a passive tool. Throughout this thesis, I have raised my concerns regarding the delegation of musical *techne* to my computer software, as well as the lack of aura surrounding the resulting dematerialised music. Yet a sense of utopian optimism persists concerning the use of computers and the web to produce and distribute music. If the absorption of a new *techne*, whether writing, computers and their software, or surfing the internet, transforms its users so thoroughly as to make them blind to its amputating effects, I wish to explain why we choose to embrace such *techne* in the first place, by returning to Plato.

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<sup>262</sup> Ong, Walter, *Orality and Literacy* (Routledge 2002), p. 83.

<sup>263</sup> *Ibid.*, p. 84.

<sup>264</sup> Davis, *TechGnosis*, p. 30.

<sup>265</sup> Ong, *Orality and Literacy*, p. 77.

## 5.1 The Platonic Space Shuttle

The development of writing did more than simply augment and externalise our memory; writing also externalised our *ideas*, subjecting them to further scrutiny outside of the psyche.<sup>266</sup> The philosopher and writer, Eric Havelock, contends that it was this opportunity for self-reflection, afforded by the alphabet and writing, that inspired and catalysed Plato's mind/body dualism, illustrated famously by Plato's 'Cave' allegory. Indeed, to illustrate how Platonic thought helped establish modern Western thought of visual contemplation, Havelock notes that the Greek word for 'view' or 'contemplation', *theoria* has transmuted into the modern word *theory*, as we understand as signifying an abstracted mental process.<sup>267</sup>

The Homeric age of the mnemonic, didactic poetry thus slowly capitulated to an age of an external memory *techne*, creating objects of contemplation and critical enquiry, free to be considered with the mental faculty now liberated from a sacrifice of mnemonic tradition. For Plato, these subjective ruminations of the *psyche* (which Havelock describes as a 'discovery of intellection')<sup>269</sup> would affirm the existence of the soul as a separate ethereal entity to the bodily, entrapped until death, whereby the soul will return to the realm of the Forms (the 'universals', as they were also known, existing outside the corporeal realm of cyclic entropy, as 'perfect ideas' or timeless technical ideals, such as mathematics and Pythagorean geometry). Havelock sums up this transformation thus: "One way of expressing this novelty would be to say that a psychic mechanism which exploited memorisation through association was being replaced, at least among a sophisticated minority, by a mechanism of reasoned calculation."<sup>270</sup> Due to this novel lucidity of the psyche's separate contemplation of, and therefore access to, the Forms, Plato sought to oppose the oral, poetic 'memorisation', which he saw as inextricably convoluting the soul and the self. Poetry was a "memorial habit of self identification with the oral tradition", merging "the personality with the tradition, and

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<sup>266</sup> A term derived from the Greek *psykhe*, which can mean 'breathe', 'life' or 'soul', and defined by Aristotle as the animating principle that catalyses life in the human body. Interestingly, the German word for soul, *Seele*, was used to denote both 'soul' and 'psyche' in the 18th Century. Only more recently was the distinction between soul and psyche made by Carl Jung, who used 'psyche' to label all conscious and unconscious activity, and 'soul' to describe the personality of a person. However, an increasingly empirical scientific community sought to distance itself from any mention of the soul due to its nebulous, religious connotations, and instead focused on 'psyche'. Rollins, Wayne G., *Soul and Psyche* (Augsburg Fortress, 1999), pp. 96-97.

<sup>267</sup> Havelock, Eric A., *Preface to Plato* (Belknap Press Harvard, 1963), p. 270. Similarly, the Greek word *idein* derives our modern word 'idea'; the Latin verb *videre* (to see) derives our modern word 'video'. But both words are cognates of the Sanskrit word *vid* (to know).

<sup>269</sup> *Ibid.*, p. 201.

<sup>270</sup> *Ibid.*

made a self-conscious separation from it impossible”.<sup>271</sup> For this reason, Plato would exclude poetry (and similar arts such as music and theatre) from his utopian *Republic*.

The primacy Plato attributed to his idealistic realm of the Forms created a profound technical bias, the influence of which we still bear witness to today within modern music technology. As I noted earlier in my discussion of Heidegger’s *Question Concerning Technology*, the *schematic*, interconnected, modular nature of music software necessitated such an acute technical mode of engagement that it ended up explicitly illustrating Enframing. Similarly, a link with Plato’s theory of the Forms is also highly evident; I contend that this *schema* (which we recall as the Greek term for ‘form’), as the logical architecture to which computer software conforms, is a direct descendent of Plato’s theory. Computer software is a manifestation of the mathematical constructs that would theoretically populate such a Platonic realm, and as such, the technical bias inherent to the use of music software reflects the very same primacy of logic and the immaterial mind as Plato’s Forms.

Plato’s mix of rational idealism and mythical transcendentalism (developed further by notable Neoplatonists such as Plotinus, Aristotle and Augustine) thus helped instigate a very literal interpretation and development that would underscore Western theology up to the present day. The common themes of transcendentalism, overcoming our corporeal trappings so that one’s soul can exist in an eternal purity, whether via Gnostic understanding, ascetic mastery or dogmatic adherence, are all common threads to Western theology. This theological device is what cultural historian Ioan Culianu termed the ‘Platonic Space Shuttle’,<sup>272</sup> though, as I will shortly explain, such a train of thought is by no means limited to theology. If the *techne* of writing, as an instrument of external, contemplative memory, assisted in catalysing the animistic notion of dualism, then we might reasonably expect to discover similar notions present amidst the landscape of contemporary information technology and online culture.

## 5.2 Cartesian Refinement of Platonic Dualism

To understand the resurfacing of dualistic mythology within contemporary technoromanticism, we need to investigate how Platonic hermeneutics bubbled-up through modern technology. The notion of technological progress as evolving hand-in-hand with human progress is, for us, something of a given, considering how mass manufacturing, information

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<sup>271</sup> Havelock, *Preface to Plato*, p. 201..

<sup>272</sup> Culianu, Ioan P., *Out of this World* (Shambhala Publications Inc, 1991), p. 188.

technology and medical breakthroughs all help elevate and extend our quality of life. Following the seventeenth-century Ages of Reason and Rationalism, fuelled by fifteenth-century moveable type and the printing press, science and technology would promise an end to superstition, ignorance and suffering. But as Jacques Ellul reminds us, “[a]ll myths directly or indirectly go back to the myth of Paradise; and the technical productivity man is witnessing seems to have spurred a proliferation of myths.”<sup>273</sup> Whether via mystical or technical methods, the differing means are to the same ends; with this in mind, it should be less surprising to discover a blurring at the edges of each.

One of the key figures of our early scientific age, philosopher and mathematician, René Descartes, would refine the Neoplatonic ontologies of body, soul and spirit, reducing these to merely body and mind (or soul). Richard Coyne expounds these rationalist deductions, and how they differ from Platonic and Neoplatonic constructs:

Descartes drew attention away from the soul and its desire to return to the unity from whence it came and on to our capacity for thought and reason. For Descartes, the goal of improvement is knowledge, which is the responsibility of the subject (the ego) who thinks. Contemplation does not take you out of the material world, but draws attention to objects, things that are situated in geometrical space in the world. On the other hand, for Platonic and Neoplatonic idealism, the real resided in the supradivine realm beyond human experience, in which one participated through study, meditative exercise, or the workings of the symbol.<sup>274</sup>

Descartes’ rational purging of a ‘supradivine’ conveyance of the soul was a casualty of his corporeal-centric drawing together of body and mind. Still a theologian, Descartes’ radical philosophical style of introspective, rational deduction saw the material body as a sensory mechanism under control by the nonmaterial mind, in what has become known as Cartesian dualism. This mechanistic, mathematical outlook of matter and motion, viewing the body as a machine or biological tool would prove prescient to technological modernity.<sup>275</sup> Instead of considering contemplative thought as existing as a foreign and ethereal tourist to our corporeal host between trips to the realm of the Forms, Cartesian dualism used our very egocentricity around which to justify our subjective existence, with the famous dictum: ‘I think, therefore I am.’

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<sup>273</sup> Ellul, Jacques, *The Technological Society* (Vintage Books, 1964), p. 191.

<sup>274</sup> Coyne, Richard, *Technoromanticism* (The MIT Press, 1999), p. 56.

<sup>275</sup> Postman, *Technopoly*, p. 35.

However, though Cartesian dualism, in using the ego as the locus for reality, appears to tighten the physical relationship between body and mind (or soul), this link is undermined by Descartes' rejection of sensory perception, which he deemed as somewhat spurious and prone to inaccuracy (reminiscent of Plato's 'Cave'). As Coyne clarifies: "The mind is the prime means of appropriating the real. The body acts as a means of receiving sense data through which we can interpret the real, but through its frailty and susceptibility to persuasion it also acts as an impediment, and Descartes was at pains to divorce reason from the vagaries of carnal weakness and passions."<sup>276</sup> What amounts to a distrust in what makes us human, while facilitating vast technological advances in science, medicine and information technology (aided and abetted by movable type), would also create the ideological legacy that contemporary technologists, techno-romantics and futurists would inherit. Such an influence has certainly not spared the music technology industry.

Indeed, as Brian Eno noted earlier, this curious exclusion of bodily interaction, muscular activity and multi-sensory engagement is typical of the modern computer-based home recording studio. The technical modes of revealing that favour a bypassing of bodily agency and tactile feedback, emblematic of modern music software, are conspicuous in their contrast with preceding recording technologies such as tape (which, by its physical nature, necessitated a high level of tactile expertise to edit accurately). This post-Cartesian bias is particularly evident with music software, being free from the physical interface design constraints of dedicated hardware, resulting in myriad menu functions and options. The link between our use of technology (whether music-specific or not) and techno-romantic tropes of emancipation are profound. Such neo-Manichean<sup>277</sup> modes of thinking do not simply catalyse romantic visions of technological post-human transcendence, but instead posit these notions as an inevitability resulting from our information technology lineage. As will be evident shortly, we are less inclined to question just *why* this post-corporeal yearning, or 'posthumanism', is positioned as a logical conclusion of technoromanticism, but more *when*.

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<sup>276</sup> Coyne, *Technoromanticism*, p. 57.

<sup>277</sup> Manicheism was a Gnostic religion, established on fundamental principles of dualism, i.e. diametrically opposed states of light and darkness, immateriality and physical matter, the mind and the body, asserting each of these as good and evil, respectively.

### 5.3 Technical Modes of Revealing the Body

A prime example of our technologically-tinted self-reflection can be found when examining technological progress at its most intimate nexus with the human body, within the medical industry. Postman uses the stethoscope to illustrate the shift in the medical industry from treating the patient, to treating the disease, as a corollary of the increasing technological divide between doctor and patient: “[I]nterposing an instrument between doctor and patient would transform the practice of medicine ... Doctors would lose their ability to conduct skillful examinations and rely more on machinery than on their own experience and insight.”<sup>278</sup> Postman references a salient quote from physician and historian, Stanley Joel Reiser, who likens the objective detachment afforded by medical technologies such as the stethoscope with the similar detachment created by the printed word. For Reiser the stethoscope “helped to create the objective physician, who could move away from involvement with the patient’s experiences and sensations ... Undistracted by the motives and beliefs of the patient, the auscultator [i.e. the doctor using the stethoscope] could make diagnosis from sounds that he alone heard emanating from body organs, sounds that he believed to be objective, bias-free representations of the disease process.”<sup>279</sup> Reminiscent of Cartesian logic, the doctor deems the patient’s report to be unreliable, and instead is able to use technology to locate the root source of the ailment; more than this, the doctor is also able to interface his medical technology with the mechanics of the patient’s body directly.

This in itself might not seem problematic, but as Reiser notes, we witness a shift from subjective evidence (in the form of the patient’s oral account of his or her ailment) to technological evidence, which has “exchanged one partial view of disease for another”.<sup>280</sup> Reiser’s concern is that technology has not merely supplemented the doctor’s prior expertise and means of amassing evidence, but has instead supplanted it. In Heideggerian terms, this technical mode of revealing has, of course, rendered all non-technical modes of revealing as spurious, not to mention simply inconvenient. The apparent objective simplicity of a binary right/wrong or positive/negative value is undoubtedly attractive to a medical professional seeking quick results; but as patients we also come to expect definitive results as part of our treatment, and trust medical technology to placate these expectations. Clearly, in a medical environment, filtering out the many nuances and complex constituent elements of disease in

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<sup>278</sup> Postman, *Technopoly*, p. 99.

<sup>279</sup> Reiser, Stanley Joel, *Medicine and the Reign of Technology* (Cambridge University Press, 1981), p. 38.

<sup>280</sup> *Ibid*, p. 230.

order to accommodate the rigid diagnosis criteria of test machinery will be problematic. The most convenient means of addressing such an issue, of course, is to embrace our technical modes of revealing, and consider the human as a machine, the brain a computer.

Since the development of modern computers based around the binary arithmetic of Boolean<sup>281</sup> logic (implemented first by American mathematician and engineer, Claude Shannon in 1938), discussions concerning the nature of the human brain, parallel to developments within computing and microprocessing, often share a substantial amount of terminology. In what amounts to one of the most explicit and common acknowledgements of the computer as a means of storing and accessing information external to us in our own image, we call on the computer's 'memory', differentiating between the volatile short-term memory of a computer's working RAM and the long-term storage memory of the hard disk drive. Unsurprisingly, similar terms are used to describe our own brain's short-term and long-term memory. Such rudimentary mechanisms based on the processing and storing of information via logic relays famously stirred mathematician Alan Turing to envisage the possibility of what John McCarthy would term 'Artificial Intelligence'. Indeed, as Postman notes, McCarthy would go so far as to claim that the cold logic upon which such an intelligence would be built, amounts to a belief system, citing a thermostat as an example of a mechanism with three beliefs, that the room is either too cold, too hot, or just right.<sup>282</sup> Such a belief system, Postman argues, incorrectly implies that simulating this interpretation of an idea is tantamount to reproducing an idea. Such beliefs also belie the biological foundation to the mind, instead envisaging the mind as interchangeable with computer technology. Again, this is another clear example of a technical mode of revealing obscuring all other modes, dictating subsequent modes of enquiry, and yet we witness the continued osmosis of computer and biological terminology every day in our casual use of computers. We speak of 'contagious' computer 'viruses', 'worms', and 'quarantines' of 'infected' software files to be 'inoculated', regarding these snippets of software code as biological entities with biological treatment.<sup>283</sup> As Postman states, "From the proposition that humans are in some respects like machines, we move to the proposition that human beings are little else but machines and, finally, that human beings *are* machines."<sup>284</sup> It is certainly little wonder, given this continued technologically-reframed reductionism, as we shall soon see, that some come to believe we

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<sup>281</sup> Named after the English nineteenth-century mathematician George Boole.

<sup>282</sup> Postman, *Technopoly*, p. 111.

<sup>283</sup> *Ibid.*, p. 112.

<sup>284</sup> *Ibid.*, p. 111.

may extricate the human consciousness from the body entirely, as an interchangeable component of man and machine; information technologies have, in essence, convinced us that the human condition can be boiled down to binary information.

#### 5.4 Social Revelations through a Technical Lens

But is this not the inevitable conclusion of a society that remains dissatisfied with the promises of technological progress? Repressing the mystical and spiritual motives and reassurance previously employed to keep us in ‘high spirits’, and replacing them with Lewis Mumford’s mytho-technological ‘megamachine’<sup>285</sup> of the eighteenth and nineteenth-century Industrial Revolution, was very much a logical catalyst for fulfilling a utopian vision in a technical mode; one of efficiency and productivity, economic might and national pride. The ‘psychal’ rewards, to use Mumford’s term,<sup>286</sup> i.e. the rewarding but dangerously inconsistent gratification felt by the hunters and farmers as a result of their exhausting labour, had been sacrificed for a dehumanized and detached way of life, deemed acceptable due to the relatively affluent comfort and security it promised. As Ellul points out, the explosion of technological growth experienced during the past two centuries occurred at such a rate as to inspire fanciful visions of societal stability and peaceful contentment (which assumed a consistent cultural rate of change), culminating in the mid-twentieth century, despite the passing of two World Wars.<sup>287</sup> Nevertheless, the birth of the silicon microchip offered another shot in the arm for techno-romantics, and led to the airing of optimistic television programmes such as the BBC’s *Tomorrow’s World*, which ran from 1965 to 2003. The cancellation of *Tomorrow’s World* reflected the zeitgeist of waning millennial excitement, indicating that the technological optimism of the late twentieth century was beginning to sour. The romantic ideas of a tech-enabled Paradise appeared increasingly naive in the face of towering global corporations; the firm grip on fossil fuels illustrated civilisation’s reliance on what now seems hopelessly archaic against the optimistic projections of the past fifty years. Ellul suggests we adopt a more sober and pragmatic assessment: “We have had to lower our sights. Man is not yet relieved of the brutal fate which pursues him. What appeared so near has again been postponed.”<sup>288</sup> Ellul is not specific about this ‘brutal fate’, but we may assume

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<sup>285</sup> Mumford, Lewis, *The Myth of the Machine* (Secker and Warburg, 1967).

<sup>286</sup> *Ibid.*, p. 215.

<sup>287</sup> Ellul, *The Technological Society*, pp. 190-191.

<sup>288</sup> *Ibid.*, p. 191.

it to be, as Shakespeare put it in Hamlet, any number of “the thousand natural shocks that flesh is heir to”, as well as, of course, our eternal struggle with universal entropy. Given the contrast between our techno-romantic dreams and the realities of a world swollen with powerful global corporations (who are happy to nurture and encourage our fantasies), plus incessant marketing and advertising, it is indeed perhaps an opportune moment to return our eyes to the ground and consider each step we take. However, a core group of techno-romantic posthumanists still hold hope in technology to provide one last hurrah for boarding the ‘Platonic Space Shuttle’, permanently escaping the biological human condition and all its associated modern-day trappings. Though given that these trappings must of course include such musical bodily pleasures such as performing and listening to music, then I content that such a technically-informed teleology is problematic for the computer musician. My growing awareness of an increasingly technically-entrenched musical practice has motivated me to reverse this technical trend, rather than embrace and encourage it.

### **5.5 The Techno-Romantic In Extremis: Digital Transcendence and Posthumanism**

Before we venture onwards with what I argue as the ultimate inevitability of the effects of technical mode of revealing, I wish to briefly recapitulate the connections I have traced so far between computer music software, Heidegger, through to Plato and towards the techno-romantic disposition.

As we recall, Heidegger’s technical modes of revealing do not bring forth a poetic revealing of the essence of a technology, but instead reveals Enframing, as a causal network or interconnected system. Such a technical mode operates on a modular logic, challenging the subjects of this mode with an assessment of potential, ripe for exploitation; our focus and engagement through technical modes reveals what Heidegger called its ‘standing reserve’. I believe that such a technical mode is evidenced in how we engage with music software, with flexible modular software environments in particular exhibiting the characteristics of Enframing. But the notion of limitless possibilities to be leveraged from our music software is but one aspect of their attraction that subsumes and reframes our attention, polarising our modes of engagement so that our subsequent considerations are also technical in nature. The dematerialised state of computer software itself presents an attractive proposition.

The *schema* or form of music software reflects a man-made realm of Plato’s Forms; a software conjuration of a world bound by promises of a digital, mathematical perfection—immaterial universals immune to the entropy of the material and physical world. Driven by

the post-alphabetical technological progress shaped by Neo-Platonism and refined by the rationalism of Cartesian logic, our computers are technical machines that belie our mystical impulses, as Davis and Coyne have shown. As I have argued throughout this thesis, this substance dualism, dividing mind and body as an aftershock of Platonic-Cartesian thought that still hold profound influence over us today, introduces problems for the computer musician. A technical mode of revealing (or as I prefer, engagement), as a conduit biased towards logic and mental negotiation between the mind and software, immediately puts bodily agency at a disadvantage; such a state neglects myriad alternative modes of engagement, technically homogenising the dialogue between musician and software. This is only further compounded when the use of the computer and music software is championed as a democratising force; such proclamations ignore these modal complications and the subsequent polarising effects of technology, and obscure an opportunity for critical assessment. As I will illustrate shortly, so unyieldingly resolute and faith-like is the enthusiasm and support for the assumption that technological progress is inextricably linked to the development of humanity, that for one to consider negative effects of technology risks being branded as a Luddite. In continuing my investigation as to why this is the case, I feel it would be productive to continue tracing the trajectories of key lines of thought running through techno-romanticism and techno-utopianism. By following these trajectories towards their extremes, I will be able to illustrate and articulate my reasons for taking up a critical stance towards these ideological discourses in my own work.

Modern medicine has, through advances in medical technology and scientific rigour, managed to curtail mythical and theological beliefs concerning the nature of the body and mind (or soul). For some, however, technological advances in computing appear to offer a very real hope for fulfilling dreams of transcendentalism. In the early years of the internet's development, the prospect of an alternate online reality offered a tantalising glimpse of a bold new frontier, a digital 'Wild West'. Indeed, the seed of such 'frontierism' would inevitably germinate within the fertile minds of a 'hermetic America',<sup>289</sup> thanks to a rich melting pot of Puritanism, Masonic enlightenment and fiercely libertarian spirit. Davis conveys the seductive potency of the myth of the American frontier: "The frontier was a liminal zone beyond the mundane boundaries of civil society, with its archons of politicians, lawyers, and established religious institutions. ... The rhetoric of the frontier became an indelible component of America's peculiarly stubborn optimism, its worship of the free self and free enterprise, its

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<sup>289</sup> Davis, *TechGnosis*, p. 124.

utopian imagination and its incandescent greed.”<sup>290</sup> The technological and economic boom of the nineteen eighties in America would exhibit all of these characteristics to provide the foundation for Silicon Valley’s mid-nineties dot-com boom (and bust), ahead of the infrastructural growth of the internet necessary to support such a growth. Nevertheless, this technological gold rush was enough to inspire a new online frontier of pioneering cyber-libertarianism, reflected in zeitgeist novels such as William Gibson’s 1984 novel, *Neuromancer*.

Gibson’s prescient portrayal of Henry Case as a computer hacker able to ‘jack in’ to cyberspace (a term Gibson coined two years prior in the short story, *Burning Chrome*), able to escape his dystopian surroundings of Chiba City and traverse the online matrix as disembodied consciousness, sparked the popularity of the ‘cyberpunk’ subgenre of science fiction. Colloquially termed as a ‘cowboy’ within the novel by Gibson, Case was a knowing nod towards the dematerialised frontier spirit that would persist in the following decade as online culture developed in earnest throughout the nineties. But it wasn’t until Electronic Frontier Foundation founder John Perry Barlow delivered his ‘Declarations of Independence of Cyberspace’ in 1996 (in response to the Telecommunications Act of that year) that the rhetoric of frontier mythology became fully crystallised and transposed to the dematerialised online realm. In a startlingly grandiose statement, Barlow illustrated cyberspace as a Gnostic, digital realm of the Forms, evoking imagery of a Platonic soul rendered as pure information, free from corporate grasp: “Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather.”<sup>291</sup> Continuing with a rallying cry of pioneering independence, Barlow stated:

Governments derive their just powers from the consent of the governed. You have neither solicited nor received ours. We did not invite you. You do not know us, nor do you know our world. Cyberspace does not lie within your borders. Do not think that you can build it, as though it were a public construction project. You cannot. It is an act of nature and it grows itself through our collective actions.<sup>292</sup>

Davis notes the curious designation of cyberspace as an ‘act of nature’, mythologising cyberspace as a newly-discovered continent in a similar manner to the pioneering colonists’ of

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<sup>290</sup> Davis, *TechGnosis*, pp. 128-129.

<sup>291</sup> <[http://w2.eff.org/Censorship/Internet\\_censorship\\_bills/barlow\\_0296.declaration](http://w2.eff.org/Censorship/Internet_censorship_bills/barlow_0296.declaration)> (Accessed 14th September 2010).

<sup>292</sup> <[http://w2.eff.org/Censorship/Internet\\_censorship\\_bills/barlow\\_0296.declaration](http://w2.eff.org/Censorship/Internet_censorship_bills/barlow_0296.declaration)> (Accessed 14th September 2010).

America.<sup>293</sup> Barlow is clearly roused by the alluring frontierism that entices with libertarian imagery, such as individual freedom, unchartered space, and the opportunities to start afresh—a cybernetic year zero. However, the American ‘Wild’ West frontier was very much a tale of hardship, physical toil and exhaustion, savage battles and desperate land-grabs; all these aspects have softened considerably given the nostalgic mythologising of a re-imagined and romanticised Wild West. However, being of a dematerialised nature, the allure of cyberspace is strengthened in presenting itself as free of these considerations of physical suffering.

I also find Barlow’s ‘act of nature’ designation intriguing; the internet is clearly a technical construct of interconnected computer networks, yet the domain of the world wide web that inhabits these vast networks appears to him as an immaterial realm of the Forms that breathes life into the parallel body of computer networks, when populated with avatars, digital spirits and souls. I believe this is the crux of the techno-romantic issue, an important revealing of the techno-romantic’s true colours, plus the ideologies and beliefs that fuel his zeal and faith in technology. The internet is a very technical mode of mystical revealing, offering dematerialised immortality for those who believe, once again revealed via technical modes, that consciousness can be re-encoded as information—the currency of the online information realm. For the techno-romantic, what we once considered our soul has been reformatted, ready for the digital age. Plato’s realm of the Forms, now constructed and realised as the internet, is ready to accommodate our digital souls just as soon as Platonic ecstasis can be realised; via a cybernetic rapture, the ‘Platonic Space Shuttle’ can finally launch. Indeed, Michael Heim is willing to cut to the chase, proclaiming that “[c]yberspace is Platonism as a working product. The cybernaut seated before us, strapped into sensory input devices, appears to be, and indeed is, lost to this world.”<sup>294</sup> As premature a proclamation as this currently is, when cast in an optimistic, polarised light of technical revealing, the techno-romantic will undoubtedly be apt to conclude that “inFORMation in cyberspace inherits the beauty of Platonic FORMS.”<sup>295</sup> As a technical substantiation of Plato’s realm of the real, cyberspace would validate Descartes dream of, as Postman puts it, “the mathematization of the world”,<sup>296</sup> as well as the realising of a reified ‘mathematization’ of the realm of the Forms. Notions of an alternative interconnected information ecology had been previously posited most prominently

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<sup>293</sup> Davis, *TechGnosis*, p. 132.

<sup>294</sup> Heim, *The Metaphysics of Virtual Reality*, p. 89.

<sup>295</sup> *Ibid.*, p. 89.

<sup>296</sup> Postman, *Technopoly*, pp. 118-119.

by Pierre Teilhard de Chardin during the mid-twentieth century, with his theory of a global ‘noosphere’, predating McLuhan’s visions of a ‘global village’.<sup>297</sup>

Ultimately, we witness a syncretism between scientism and mysticism, their respective ideological arcs, once divergent, finally converge on a technical means of challenging death, with a creation of our own posthuman afterlife: “Cyberspace consists of transactions, relationships, and thought itself, arrayed like a standing wave in the web of our communications. Ours is a world that is both everywhere and nowhere, but it is not where bodies live.”<sup>298</sup>

If Barlow’s manifesto is a largely symbolic rebuttal of governmental meddling, there are still plenty of futurists armed with a more literal ideology, quietly researching and devising methodologies to facilitate their dreams of post-corporeal existence. One such group of cyber-libertarian ‘posthumanists’ (or ‘transhumanists’)<sup>300</sup> were the Los Angeles-based futurists, the ‘Extropians’.<sup>301</sup> Forming in 1987, three years after the publication of *Neuromancer*, the Extropians, as their name suggests, set about limiting or evading the degenerative effects of entropy, artificially boosting what they saw as human evolution with programmes of transhuman augmentation. Much of their transhumanist research investigated fashionable topics of the period, reading like a list of science fiction plot subjects, such as cryogenics, nanotechnology, artificial intelligence, space colonisation and of course, life extension. Buoyed by Silicon Valley-infused optimism, Extropy founder Max More penned a similarly impassioned manifesto to that of Barlow, exuding a fierce utopian cyberlibertarian

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<sup>297</sup> In his 1959 book, *The Phenomenon of Man*, French Jesuit writer and philosopher Pierre Teilhard de Chardin developed the idea of a ‘noosphere’ (from the Greek word ‘nous’, meaning ‘mind’) of information literally enshrouding the planet as an atmosphere of interconnected thought. Published posthumously due to the challenges it presented to Roman Catholicism, Teilhard posited the theory that the noosphere developed as a stage of geological evolution. Initially emerging as a result of human speech and thought, the noosphere would become increasingly dense with information due to developments in media technology. Teilhard envisaged a watershed moment he termed the ‘Omega Point’, whereby the noosphere would become so dense as to destroy its anchoring in the material world, existing as a realm of pure thought and information. Despite these somewhat fanciful notions of an apocalyptic Gaian information ecology, Teilhard is nevertheless regarded as a prophet within the field of information technology, following the apparent substantiation of his theory with the development of the internet, and his implication of digital transcendence.

<sup>298</sup> <[http://w2.eff.org/Censorship/Internet\\_censorship\\_bills/barlow\\_0296.declaration](http://w2.eff.org/Censorship/Internet_censorship_bills/barlow_0296.declaration)> (Accessed 14th September 2010).

<sup>300</sup> According to the World Transhumanist Association FAQ <[www.transhumanism.org/resources/FAQv21.pdf](http://www.transhumanism.org/resources/FAQv21.pdf)> (Accessed 14th September 2010), the term ‘posthuman’ is used to describe “beings whose basic capacities so radically exceed those of present humans as to be no longer unambiguously human by our current standards”, such as exhibiting immortality, existing as an artificial intelligence or an ‘uploaded’ consciousness. ‘Transhuman’, on the other hand, describes an intermediary form between the human and posthuman. Physical and mental augmentations, genetic modifications, for example, would be characteristics of transhumans.

<sup>301</sup> <[www.extropy.org](http://www.extropy.org)> (Accessed 14th September 2010).

spirit in his periodically revised ‘Principles of Extropy’,<sup>302</sup> intended to “codify proactive, life-affirming and life-promoting ideals”,<sup>303</sup> via transhuman means. As Davis observes, despite the Extropians’ attempt to follow an open-minded path of rational scientific empiricism, defiantly rejecting “totalistic dogmas”,<sup>304</sup> it appears to remain “blissfully ignorant of the often naive assumptions that lie beneath its own, almost adolescent enthusiasms.”<sup>305</sup> Indeed, More’s ‘Principles’ read like a list of techno-romantic ideals, self-improvement goals and nebulous new age jargon. On self-improvement, sounding eerily like an emotionally detached artificial intelligence, More states: “Perpetual self-improvement requires us to continually re-examine our lives. Self-esteem in the present cannot mean self-satisfaction, since a probing mind can always envisage a better self in the future.”<sup>306</sup> Shunning faith in God, the State or any other external influence, More nevertheless appears to be under the quixotic spell of technology, ever optimistic of a utopian ‘open society’ of self-actualised individuals, free of impulsive or irrational, negative emotions. More can so easily envisage this seamless technological upgrade of the human body as it undertakes its transhuman voyage towards transcendental posthumanism precisely because he already views the human body through a lens polarised by a technical mode of revealing.<sup>307</sup> Yet, somewhat mysteriously, the Extropy Institute closed its doors in 2006, eighteen years after its official founding; the Institute provides little clarification on its decision to cease, other than it “deems its mission as essentially completed”.<sup>308</sup> Still, its community remains active as an ongoing resource for transhumanist information and discussion.

If the Extropy Institute positions itself as a research corporation, remaining nebulous about all but its core mission statement, then Ray Kurzweil is unabashedly explicit in his personal hopes for immortality via the digitisation of consciousness. An award-winning inventor, founder of his eponymous keyboard musical instruments, and an enthusiastic futurist, Kurzweil is a heavyweight in the field of computer science, building a reputation for technological prescience. Within his writings, he evinces a feverish techno-optimism concerning the development of artificial intelligence, as well as expressing similar posthuman

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<sup>302</sup> <[www.extropy.org/principles.htm](http://www.extropy.org/principles.htm)> (Accessed 14th September 2010).

<sup>303</sup> Ibid.

<sup>304</sup> Ibid.

<sup>305</sup> Davis, *TechGnosis*, p. 143.

<sup>306</sup> <[www.extropy.org/principles.htm](http://www.extropy.org/principles.htm)> (Accessed 14th September 2010).

<sup>307</sup> Perhaps the most effectively realised development of technical conditioning-as-ideology is L. Ron Hubbard’s Church of Scientology, a veritable cult of corporate cybernetics.

<sup>308</sup> <[www.extropy.org/future.htm](http://www.extropy.org/future.htm)> (Accessed 14th September 2010).

desires to those of the Extropians, and as such is a notable example of the powerful romanticism that fuels modern technological progress.

For Kurzweil, as detailed in his 2005 book *The Singularity is Near* (an elucidation of forecasts expressed in *The Age of Spiritual Machines* in 1999), the twenty-first century will inevitably deliver the promise of post-biological immortality, as a result of the continued growth in computing power.<sup>309</sup> Kurzweil's faith in such an epochal event assumes a continuation of Moore's Law, describing the doubling of computing power approximately every two years (which, given current microchip architecture, is understood as doubling the number of transistors per each silicon chip).<sup>310</sup> This ensuing exponential growth in computing power, Kurzweil posits, will result in a technological 'singularity',<sup>311</sup> whereby a moment of rapid technological growth will occur as a result of computers becoming powerful enough (i.e. exceeding human intelligence, which Kurzweil predicts will occur around 2020)<sup>313</sup> to initiate a chain reaction of recursive self-improvements. Accordingly, once we have reached this point in technical evolution, "the innovation needed for further turns of the [evolutionary] screw will come from machines themselves."<sup>314</sup> This theme of accelerating technological progress, as illustrated by Moore's Law, is what Kurzweil terms the Law of Accelerating Returns, and is a central tenet to his faith of an impending posthuman revolution.

Kurzweil's assumptions that underlie his faith are not solely limited to a belief in Moore's Law. His predictions rely on the technical nature of our understanding of evolution, specifically the biological mechanisms involved in regulating the replication of DNA.<sup>315</sup> Again, I contend that this technical means of understanding the 'blueprint' of the human body is problematic. Just as computer and network vernacular is peppered with biological terms such as 'virus', 'inoculation', 'worms' and 'spiders' etc., so Kurzweil describes the biological evolutionary process in computer terms, deeming evolution a 'master programmer', and talks

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<sup>309</sup> Whether by means of a digital consciousness via scanning and uploading, the gradual transhuman replacement of biological neurons with technical counterparts, or bioengineering.

<sup>310</sup> It is thought that Moore's Law, named after Intel engineer Gordon E. Moore, will hit the practical limits of current microchip architectures at around 2019, once transistor scales approach atomic level. However, Kurzweil is confident that this limit can be circumvented by improved, alternative microchip architectures built on optical, biological or quantum computing.

<sup>311</sup> Science fiction author and mathematics professor Vernor Vinge popularised the term in his 1993 essay, 'The Coming Technological Singularity', building on mathematician Irving J. Good's initial theory. Prior to Kurzweil, the term was understood as describing near-instant technological growth, but Kurzweil primarily uses the term as a means of exploiting this growth in technology to prolong our lives indefinitely.

<sup>313</sup> Kurzweil, Ray, *The Age of Spiritual Machines* (New York: Viking Penguin, 1999) p. 3.

<sup>314</sup> *Ibid.*, p. 35.

<sup>315</sup> During replication, errors occasionally occur despite the biological corrective measures in place, and while these are usually destructive, they very occasionally result in mutations that play an advantageous role in natural selection.

of the ‘error-correction’ capabilities of ‘little chemical machines’ as they go about their ‘information-processing transaction’, during DNA replication.<sup>316</sup> It is little surprise that Kurzweil believes that the transhuman process is an inevitability of the near future; according to the cyborgian terminology he uses, we have already begun such a transformation. To Kurzweil, DNA code is merely computer code waiting to be translated and compiled, and he believes that we can use the Law of Accelerating Returns to create and accelerate our own evolution of machine intelligence.<sup>317</sup> The very notion of DNA as ‘information’ is itself animism manifested through literacy, as though a riddle waiting to be solved before whispering its secrets to us.

Following his conflation of technological and biological evolution, Kurzweil hopes to utilise the vast post-singularity computational power to reverse-engineer the human brain, unlocking the secrets of consciousness from its bodily shell. Paul Myers, associate professor at the University of Minnesota Morris and the author of the evolutionary biology blog Pharyngula, criticises Kurzweil’s technological reductionism of the brain as a program borne of a DNA computer code base:

Its design is not encoded in the genome: what’s in the genome is a collection of molecular tools wrapped up in bits of conditional logic, the regulatory part of the genome, that makes cells responsive to interactions with a complex environment. The brain unfolds during development, by means of essential cell-cell interactions, of which we understand only a tiny fraction. The end result is a brain that is much, much more than simply the sum of the nucleotides that encode a few thousand proteins. He has to simulate all of development from his codebase in order to generate a brain simulator, and he isn’t even aware of the magnitude of that problem.<sup>318</sup>

In essence, Kurzweil’s stance is a technical development of Cartesian logic, viewing the brain as a neural net processor on which the ephemeral software processes of consciousness can run. This stance disregards the notion of the brain as developmentally reliant on sensory stimulus, that is itself dependent on the external environment, experientially bridging the divide between the core DNA ‘instruction set’ and the billions of interconnected neurons that create an emotional consciousness. Instead, this view regards the brain as a separate component within the human machine, capable of processing sensory information. Myers argues that without considering and understanding the complex iterative protein interactions

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<sup>316</sup> Kurzweil, *The Age of Spiritual Machines*, p. 46.

<sup>317</sup> *Ibid.*, p. 47.

<sup>318</sup> Myers, Paul Zachery, <[http://scienceblogs.com/pharyngula/2010/08/ray\\_kurzweil\\_does\\_not\\_understa.php](http://scienceblogs.com/pharyngula/2010/08/ray_kurzweil_does_not_understa.php)> (Accessed 14th September 2010).

involved during the development of the brain, we cannot possibly understand the brain. Simply waiting for sufficient computing power to model (i.e. reverse engineering) the brain as a collection of interacting neurons, in the hope that consciousness will be sparked into life, is for Myers, a technical, materialist misinterpretation of the culmination of biological development. Envisaging neurons as biological transistors is a fallacy epitomising technical conceit. In Heideggerian terms, Kurzweil views the DNA codebase as ‘standing-reserve’, to be exploited technically through Enframing—a technical mode of revealing. However, as Myers implies, this technical mode of revealing will not result in an alethic *poiesis*, but only the technical ends of a technical means, and as such will not bring forth an understanding of consciousness, only the structure of the brain.

Indeed, Kurzweil’s faith in Moore’s Law and his Law of Accelerating Returns, as well as his monistic materialistic faith that a brute force method of modelling the human brain will explain consciousness is typical of what, in the late seventies, science philosopher Karl Popper, termed ‘promissory materialism’.<sup>319</sup> Popper defines this as consideration of the present untenability of materialism, yet expectantly “offers us the promise of a better world, a world in which mental terms will have disappeared from our language, and in which materialism will be victorious.”<sup>320</sup>

Following his work with Popper, the Nobel Prize-winning neurophysiologist, John Eccles, succinctly articulated his issue with promissory materialism:

I regard this theory as being without foundation. The more we discover scientifically about the brain the more clearly do we distinguish between the brain events and the mental phenomena and the more wonderful do the mental phenomena become. Promissory materialism is simply a superstition held by dogmatic materialists. It has all the features of a Messianic prophecy, with the promise of a future freed of all problems—a kind of Nirvana for our unfortunate successors.<sup>321</sup>

Eccles appears to pinpoint Myer’s previous inference of Kurzweil’s enthusiastic but misguided attempts to understand and recreate consciousness via technical means, and illustrates my contention of techno-romanticism as hinging on a set of utopian faiths that belie the ostensive rational logic of these technical means. It is beyond the remit of this thesis to speculate on the accuracy of Kurzweil’s predictions; his chosen technical mode may well bear

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<sup>319</sup> Popper, Karl, *The Self and its Brain* (Routledge, 1977), p. 96.

<sup>320</sup> *Ibid.*, p. 97.

<sup>321</sup> Eccles, John C., *How the Self Controls its Brain* (Springer, 1994), p. 7.

fruit eventually, but given his chosen methodology the outcome is moot. Kurzweil's faith in his Law of Accelerating Returns, and his consequent faith in Moore's Law is reflected across the technology; as such, mythology drives progress. I feel it is imperative to acknowledge and understand the sentiments behind such myths lest I become unwittingly entwined within the subject of such myths, specifically pertaining to the future of computer music practice. As philosopher Mary Midgley reminds us, reflecting McLuhan's warnings of the hidden message of media:

We have a choice of what myths, what visions we will use to help us understand the physical world. We do not have a choice of understanding it without using any myths or visions at all. Again, we have a real choice between becoming aware of these myths and ignoring them. If we ignore them, we travel blindly inside myths and visions, which are largely provided by other people. This makes it much harder to know where we are going.<sup>322</sup>

Kurzweil's faith in the technical may be an extreme example of techno-utopianism, yet the mythology that drives him is an ontological constant; his fear of death, a shadow on the inexorable axis of entropy, is an essential human understanding, and a core motivation for his faith.<sup>323</sup> The core premise of opposing entropy, given the tantalising purity and apparent longevity of information within a system of accelerating returns, is an attractive and fitting inevitability for a society increasingly polarised by technical modes of revealing. Indeed, I can sympathise with Kurzweil as a musician, in that my attempts to fashion music, as an ordering of noise, are my very own means of briefly challenging inexorable entropy; playing my part on an Attalian stage, channelling the violence of noise.

Interestingly, though unsurprisingly, there appears to be a pattern emerging to the epochal proclamations made by futurists concerning exactly when the technological singularity will occur. In the 1993, MIT researcher Pattie Maes gave a talk at the Ars Electronic conference in Linz, Austria, explaining a tendency among her (mostly male) colleagues to predict the occurrence of a *favourable* technological singularity as just within the limit of their lifespan, at around their seventieth birthday.<sup>324</sup> Joel Garreau, author of *Radical Evolution*, in which he examines the implications of transhumanism, discussed

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<sup>322</sup> Midgley, Mary, *Science and Salvation* (Routledge, 1992), p. 13.

<sup>323</sup> Kurzweil reportedly takes around two-hundred vitamin pills each day, adhering to the Pritikin regime of diet and exercise, in an effort to extend his natural lifespan long enough to witness the singularity. <[www.wired.com/medtech/drugs/magazine/16-04/ff\\_kurzweil?currentPage=all](http://www.wired.com/medtech/drugs/magazine/16-04/ff_kurzweil?currentPage=all)> (Accessed 14th September 2010).

<sup>324</sup> <[www.newscientist.com/article/dn18301-five-laws-of-human-nature.html?full=true](http://www.newscientist.com/article/dn18301-five-laws-of-human-nature.html?full=true)> (Accessed 14th September 2010).

similar findings to those of Maes, yet it was not until these collective observations reached Wired editor Kevin Kelly that they gained traction. Kelly crystallised this apparent cognitive bias as the ‘Maes-Garreau Law’, proposing that “[t]he latest possible date a prediction can come true and still remain in the lifetime of the person making it is defined as The Maes-Garreau Point. The period equals to  $n-1$  of the person's life expectancy.”<sup>325</sup> Although the observations of Maes and Garreau are little more than anecdotal, they do hint at the romantic utopian mechanisms that fuel and propel technological progress.

## 5.6 Understanding the Techno-Utopia

As previously noted, using Moore’s Law as an example, the mythic catalyst of techno-romantic narratives appears to sustain technological progress; once a particular technology becomes commonplace, a superseding technology revives the surrounding mythology, reigniting techno-romanticism. Coyne recalls Martin Plattel’s main characteristics of utopian narratives,<sup>326</sup> which prove helpful in summing-up the techno-romantic narratives I have encountered and outlined throughout this thesis.

Firstly, we must contend that utopian narratives are moralistic, creating an idealised vision different to that of contemporary culture, in order to create a motivational goal. Plattel suggests that this moralistic viewpoint arose from a breakdown of the “medieval pattern of life, based on the idea of a transcendent and divine Providence ... The Renaissance breaks away from the axiom that the lot of man and society is immutably set by God and must be accepted”.<sup>327</sup> This emerging utopian characteristic would be literary in nature (being catalysed by technology), exemplified in 1516 by Thomas More’s *Utopia*. Instead of considering the Platonic ideal as a realm existing beyond reality, More would place it within the borders of society’s ideals, acknowledging man as an agent of his own dominion. Of course, a utopian goal remains, by name, unattainable, yet must appear feasible at all times to function. As McLuhan and Heidegger remind us, this illusion remains hidden from us for as long as we are uncritically involved with the subjects of a technology,<sup>328</sup> such as the internet, blinded by the

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<sup>325</sup> Kelly, Kevin, ‘The Maes-Garreau Point’, <[www.kk.org/thetechnium/archives/2007/03/the\\_maesgarreau.php](http://www.kk.org/thetechnium/archives/2007/03/the_maesgarreau.php)> (Accessed 14th September 2010).

<sup>326</sup> Coyne, *Technoromanticism*, p. 21.

<sup>327</sup> Plattel, Martin, *Utopian and Critical Thinking* (Pittsburgh, Pa.: Duquesne University Press, 1972), p. 30.

<sup>328</sup> “We are all robots when uncritically involved with our technologies.” McLuhan, Marshall and Fiore, Quentin, *War and Peace in the Global Village* (New York: Bantam, 1968), p. 18.

romantic mythology of promissory materialistic projections, granting myriad possibilities and opportunities.

This leads to Plattel's next characteristic, namely the presentation of a one-dimensional representation of utopia, rarely turning inward for reflexive criticism. This characteristic develops the technologically enabled agency of man, as "utopian interest no longer seeks to *find* new possibilities but tends to *make* and *create* them."<sup>329</sup> As our rate of scientific progress increased, from the eighteenth century onwards, improving our standards of living and economic productivity, we adopted an increasingly positivistic bias regarding societal progress. Up to this point, man managed to retain a unified utopian outlook with the technological progress relied upon to work towards it; faith in an unalloyed march of progress was balanced between utopian ideals and rational, scientific practice: "But the rise of positivism overemphasised the value of science at the expense of utopian thinking. The consequences of this were that, on the one hand, the utopian approach was reduced to a prescientific way of thinking and, on the other, that reason increasingly assumed the form of a narrow and functional rationality."<sup>330</sup> With the rise of the social sciences, our social considerations, previously contemplated in formulating a utopian response, would now be addressed in scientific terms. As Kurzweil unwittingly illustrated, technological modes of revealing seduce us, reframe our reference points and polarise our dreams. Attali also displays evidence of such a characteristic with his nebulous portrayal of 'Composing', side-stepping the issue of an information glut of musicians' online work crying out for attention, as well as steering focus away from the issue of remuneration for his Composers. Only the scientific social ideal can be viewed in clear focus; non-technical contingencies cannot be addressed.

The characteristics of a techno-romantic narrative, according to Coyne, function dialectically, mirroring Hegel's model as an indeterminate process that propels progress: "The concepts of the past glory, the present distress, and the future salvation are informed by one another",<sup>331</sup> as a mechanism of diachronic feedback and introspection. The most enticing utopianism "exhibits the pattern of paradise, fall, and salvation",<sup>332</sup> which can be seen in Attali's *Noise*; a fall from Sacrificing, through Representing to a hyper-commoditised Repeating. Posited as an Adornian crisis of meaningless and endless consumption, awash in a glut of post-auratic product, Repeating functions as the bleak present (though as I have argued

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<sup>329</sup> Plattel, Martin, *Utopian and Critical Thinking*, p. 35.

<sup>330</sup> *Ibid.*, p. 42.

<sup>331</sup> Coyne, *Technoromanticism*, p. 173.

<sup>332</sup> *Ibid.*, p. 172.

in the first chapter, this outlook depends on whether one functions primarily within the modes of production, or consumption). Composing should therefore be situated as the salvation to Repeating's fall. However, according to Plattel, we risk creating a future ideal in response to our technological present, imagining technical solutions to technical problems. In doing so, we forego the utopian dialectic in attempting to create a stable, step-by-step means of realising such a future. Instead of using utopian ideals as a goal, we fabricate technological social myths lacking the essential vector to set us in the correct direction.

“It is no coincidence that the rise of industrial civilization took place at the same time as the birth of social myths. Modern technological power forces man to assume responsibility for his own destiny. The tempestuous evolution in industry automatically orientates society to the future. Not the past but only the future can be the norm. The familiar religious worldview and picture of man has lost credence, but faith in the new values which give direction to the future is still missing.”<sup>333</sup>

This raises the question: is Composing a realisable state, driven by utopian dialectics, or a social myth, constructed within the fog of our technological present? When Attali spoke to update Composing in 2001, in light of the emergent decentralised potential for online music distribution, he attempted to ground his evocative romanticism with the present, thus creating a powerful and persuasive means of perceiving Composing (if not the actual means of realising it). But given the technical nature of this missing link, Attali's update appears to fall foul of Plattel's characteristic of technological emancipation as social myth. Plattel sums up the precariousness of our technocratic society, stating: “On the one hand, it is the prisoner of its own freedom since it has no possibility of identifying with spiritual values which give meaning and direction to life. On the other, the technocratic and bureaucratic order is a golden cage, which offers society only the freedom allotted to a prisoner.”<sup>334</sup> It is little wonder, then, that we find instances of a technocratic society replacing the eschatological myths of theology with similar social myths of technology, as Kurzweil and Attali both do.

For McLuhan, following the potential of an electric age to deliver us from our detached age of mechanised alienation, a new global village re-cast in the glow of online technology promised the electronic retribalisation of the West.<sup>335</sup> Even so, I argue that such a

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<sup>333</sup> Plattel, Martin, *Utopian and Critical Thinking*, p. 58.

<sup>334</sup> *Ibid.*, p. 59.

<sup>335</sup> During his 1969 interview with Playboy, McLuhan elucidates this contention: “Every aspect of Western mechanical culture was shaped by print technology, but the modern age is the age of the electric media, which forge environments and cultures antithetical to the mechanical consumer society derived from print. Print tore

retribalisation stresses McLuhan's dictum of the media as message, encoding its promise as a technical mode of dematerialised information; the web is a literal encoding of text, sound and vision—a quintessential alphanumeric environment. Experiencing this technical mode, our salvation is consequently re-written to respond to the needs of our digital post-Cartesian selves, with the kind of utopian romanticism postulated by futurists such as Kurzweil. Far from harking back to a pre-Socratic society, prior to our alphabetic 'reformatting', to a 'Golden Age' of idyllic tribal Arcadia, the web compounds our technicality as the unconscious message of the medium while we constantly receive conflicting conscious messages of emancipation. It is our golden cage.

One of the early proponents of online culture, musician, writer and computer scientist Jaron Lanier (who pioneered developments in 'Virtual Reality'—a term he coined during the late eighties), has observed what he feels is the web's fall from grace since its initial promise of a collaborative and democratic global village. Being a musician, as well as a respected futurist, Lanier is well placed to understand the effects of the online economy on creative practices. After his initial excitement at the prospect of decentralised distribution during the late nineties (sentiments then shared by myself as a fledgling musician), Lanier appears to have had second thoughts over the direction in which online culture is heading.

Expressing his fears over the corporatising of the web, as the largest companies typically seek to absorb and aggregate information, Lanier uses the fall of print media to illustrate his concern: "In the new environment, Google News is for the moment better funded and enjoys a more secure future than most of the rather small number of fine reporters around the world who ultimately create most of its content. The aggregator is richer than the aggregated."<sup>336</sup> I argued the exact same concern with the rise of online music aggregation and commerce: download stores such as iTunes and Amazon mp3 generate value as a company by leveraging musicians, themselves of negligible value, using long tail economics to aggregate millions of artists' output into a profitable model. The current trend towards access to music via streaming rather than downloading, as exemplified by the ad-supported services Spotify<sup>337</sup>

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man out of his traditional cultural matrix while showing him how to pile individual upon individual into a massive agglomeration of national and industrial power, and the typographic trance of the West has endured until today, when the electronic media are at last demesmerizing us."

<[www.mcluhanmedia.com/m\\_mcl\\_inter\\_pb\\_02.html](http://www.mcluhanmedia.com/m_mcl_inter_pb_02.html)> (Accessed 14th September 2010).

<sup>336</sup> Lanier, Jaron, 'Digital Maoism: The Hazards of the New Online Collectivism', May 2006

<[http://edge.org/3rd\\_culture/lanier06/lanier06\\_index.html](http://edge.org/3rd_culture/lanier06/lanier06_index.html)> (Accessed 14th September 2010).

<sup>337</sup> <[www.spotify.com](http://www.spotify.com)>

and We7,<sup>338</sup> only exacerbates the difficulty in remunerating individual artists. Often likened to a flexible broadcast model of music distribution, these streaming services pay artists a fraction of the earnings derived from conventional downloads, or traditional media such as radio airplay and physical sales.<sup>339</sup>

It does indeed appear that while I spent my formative years as a starry-eyed musician, naively dreaming of distributing my music directly to listeners, corporate venture has swept in and wrung the online economy for all its worth, strengthening its previous stranglehold on the music market. Casting back to Attali's predictions for the future of online music distribution, as detailed at the start of the first chapter, it seems our choice boils down to an acceptance of this persistence of Repeating, dominated by corporate aggregation, or giving our music away. The economic net result of either option is very similar. As New York Times writer John Tierney sympathises: "In the 1990s, when I was writing paeans to the dawning spirit of digital collaboration, it didn't occur to me that the Web's 'gift culture', as anthropologists called it, could turn into a mandatory potlatch for so many professions—including my own."<sup>340</sup> Paul Goldstein's 'Celestial Jukebox' has indeed come to pass, yet the sacrifices that have hitherto remained obscured in the golden glare of utopian techno-romantic projections, are now clear as day. Lanier describes this predicament in terms of 'digital peasants' being forced to produce free material for the large aggregative 'lords of the cloud' such as iTunes, Google and YouTube.<sup>341</sup> We are essentially digital proletariats, producing information such as dematerialised music for our techno-bourgeoisie masters, despite the self-help, mystical positivism frequently espoused by futurists such as Anderson and Kelly of *Wired*, whom Richard Barbrook calls prime proponents of the 'Californian Ideology'.<sup>342</sup>

Like Lanier, I was initially seduced by the notion of a decentralised online musical agora, and indeed, ten years ago I am sure that I too would have been proclaiming the dawn of Attali's Composing. But this past decade has seen considerable changes occur in the online ecology, as the increasingly crowded web teems with dizzying torrents of information, moving with such speed and momentum that to add one's music to such a fierce current is but

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<sup>338</sup> <[www.we7.com](http://www.we7.com)>

<sup>339</sup> Lady Gaga, one of the most lucrative pop successes of recent years, reportedly earned just \$168 from a million plays on Spotify. See <<http://www.guardian.co.uk/music/2010/apr/13/spotify-songwriters>> (Accessed 14th September 2010).

<sup>340</sup> Tierney, John, 'The Madness of Crowds and an Internet Delusion', *The New York Times*, January 12th, 2010, <[www.nytimes.com/2010/01/12/science/12tier.html](http://www.nytimes.com/2010/01/12/science/12tier.html)> (Accessed 14th September 2010).

<sup>341</sup> Lanier Jaron, *You Are Not a Gadget: A Manifesto* (Allen Lane, 2010).

<sup>342</sup> Barbrook, Richard, 'The Californian Ideology', <[www.hrc.wmin.ac.uk/theory-californianideology-main.html](http://www.hrc.wmin.ac.uk/theory-californianideology-main.html)> (Accessed 14th September 2010).

a drop in the ocean, instantly anonymised amid the deluge. To continue the metaphor, the only way to organise and process such a fragmented and variegated glut of information is to create an organisational structure on the scale of Google, iTunes and Facebook, to trawl so deeply and broadly that the cumulative pickings create a profit.

## Conclusion

When I first began my research, attempting to articulate my concerns as a computer musician in an age of increasingly dematerialised music, I had naturally hoped to be able to conclude with a definite trajectory in place for addressing the issues I had uncovered. To a certain extent this is true, as I have experienced elements of success throughout my efforts to restore auratic uniqueness, creative meaning and value to my work. The vague anxieties I had struggled to express have, unsurprisingly, turned out to be reflected by what I perceived as an increasingly vague and homogenised creative practise. Yet, although I now feel better able to address these issues, the processes I have undertaken so far, documented over the course of this thesis, have served to illustrate just how deeply entrenched I am in my practise as a creative technician; the magnitude of the challenges presented by this research has slowly revealed itself to me as I sought to address them. As such, the path I have taken, on reflection, appears meandering and laboured; unable to fully grasp the route of this journey, the trajectory of my creative practice has necessarily been continually adjusted and corrected, in light of my ongoing research. What is now clear, however, is that this progression towards creative rematerialisation represents a small leg of a larger journey.

The notion that Attali's age of Composing has finally arrived, catalysed by the development of the web, belies the complexities of the myriad factors at play, encountered from the perspectives of both musician and listener; these respective stances of production and reception regard the facets of such an age with varying weight and significance. Dematerialised music, existing as pure use-value, presents a problem for recording artists attempting to secure an audience for their music. For a society weaned on music as a Debordian spectacle, with an inherent friction between its physical form, its exchange-value and its function or use-value, the move towards dematerialised music creates a rupture between the perceptions of use-value and the costs of production. It is unclear whether such a rift will heal, as the music industry is finally shifting towards a model of access and convenience rather than simply production; in such a model, the aggregator retains power over both modes of production and reception.

In this sense, a technologically-mediated ambivalence has been created between the modes of production and reception; portable, ubiquitous music allows listeners to reverse the systematic destruction of ritual value in music, re-ritualising music as part of the prismatic affordances of music through its quotidian use. Repeating, for modes of reception at least, is a liberating age of abundance, convenience and expression, opposing Attali's pessimistic

portrayal. Contrasting this with the other side of the balance, modes of production cannot be said to have been leveraged by the same degree, as production is now mediated by technical simulacra that cast the compositional process in their own technical light. As music becomes a data sign with function but no form, modes of musical production have been technically polarised and homogenised to create a model of digital neo-Fordism, the resulting ‘long tail’ output of which is harvested by the data-crunching, hegemonic ‘lords of the cloud’, being the only mechanisms large enough to assimilate and process such volumes of music. Being one of the producers within such a chain of production does not feel empowering or liberating, but more akin to a hyperextension of Attalian Repetition, fuelled by the techno-romantic myth of Composing.

Regarding the modes of engagement assumed when negotiating the online economy, Tara McPherson sums up the issue:

Thus, it’s important to recognise that these emergent modes of experience are neither innocent nor neutral, simple expressions of the material forms of the digital. They model particular modes of subjectivity which can work all too neatly in the service of the shifting patterns of global capital. ...

In conclusion, we might ask why, in a culture increasingly subject to simulation, volition (or its illusion) [at the core of the interactive ‘Web 2.0’] emerges as such a powerful modality of experience, such a visceral desire. If Walter Benjamin reminds us that early film served to drill the viewer in the modes of perception structured by the mechanical era, how do Web spaces function as instructions for our bodily adaptation to virtuality?<sup>343</sup>

As we have seen, the proclamations made by techno-romantics and technologists in response to the perceived possibilities offered by decentralised, online disintermediation, do not consider the effects of such technologies; critical observations are obscured during engagement with these technologies, as McLuhan and Heidegger have illustrated in their own differing ways. Furthermore, the lure of the utopian with regard to music and the web neglects to address just how readily such a technological framework succumbs to corporate appropriation. The web does not so much provide ‘instructions for our bodily adaptation to virtuality’ as disregard bodily agency entirely; as we witness with posthumanists such as Kurzweil, what seem technologically-assisted inevitabilities emerge as a result of this technological polarisation, biased, as it is, towards the logic of the mental and non-physical as

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<sup>343</sup> McPherson, Tara, ‘Reload: Liveness, Mobility and the Web’, in *New Media, Old Media* (New York, London: Routledge, 2006), p. 207.

a reflection of itself. Such symptoms are central to the conceit of ‘progress’ as measured by technological advancement.

Yet musical practice consists of a balance between technical and creative modes of revealing, and is therefore the perfect vantage point from which to observe these modal shifts. As I have argued, my personal practice has seen a shift in favour of these technical modes, at the expense of creative modes of engagement. It reflects a wider cultural shift that has split the nucleus of *techne*, resulting in a dominant technical mode of Enframing, as Heidegger asserts. The dematerialised *schema* of computer software reinforces this modal domination, functioning as direct insight into fundamental ideologies that have crystallised over the past two and a half thousand years with the ontological development of Platonic thought—itsself catalysed by technology. The idealistic ‘forms’ of the software realm, free from physical decay and the laws of entropy, continue to assert the primacy of technology as bound with progress. Such a trajectory is illustrated explicitly by the techno-romantic posthumanists, betraying their fears of mortality and their yearning for technological ecstasis; this trajectory is shared by the tech-evangelists who encourage would-be Attalian Composers.

Only in my attempts to rematerialise my practice, then, has the full extent of my prior technological entrenchment become apparent. My delegation, or submission, of *techne* to my music software rests at the foundation of my practice, and I have built upon this with practical knowledge accordingly. It is therefore unrealistic and unwarranted for me to attempt to extricate my practice from this technological bedrock completely, and so my strategies have instead attempted to readdress the balance of *techne* by combining my technological praxis with a tactile engagement of crafting. In restoring the full spectrum of creative modes to work *in tandem* with technical modes, I have addressed the issues with dematerialised music that I formerly struggled to articulate.

By establishing a means of auratic restoration, in the form of my ‘Auratic Artefacts’ series, the site-specificity of *Reception*, and my ‘Poietic Plug-ins’ project, I have journeyed towards a greatly fulfilling and much-needed reclamation of *techne*. Yet, they have also served to remind me of the chaotic nature inherent to a full spectrum of creative modes, once extracted from the technically streamlined realm of pure software. This introduces a host of practical issues, posing problems to be solved, hurdles to be cleared. Yet all these practical and logistical issues make the end result feel more satisfying. Seeing an instrument that has been crafted into being, not only serves as a memento of the effort entailed during its creation, but also a physical, qualitative reminder of its uniqueness and potential; an artefact or trophy of permanence, that was lacking from dematerialised music and its practice.

The time spent creating and organising these ventures may have detracted from my compositional output in terms of quantity, yet what I feel I have achieved is of greater meaning and satisfaction, richer in quality because of it. Moreover, the groundwork has been laid for further expansion towards an ensemble of Poietic Plugins, or the creation of interesting musical artefacts, plus installations and performances that break out of the idiomatic rigidity I feel I had imposed on myself. In this respect, this conclusion serves as a launchpad for further exploration, of which I now feel more capable.

## Appendix

### Arduino Code for the Poietic Plug-in Glockenspiel

I used the following code to power my Poietic Plug-in, building on code originally developed by the Arduino Community.<sup>344</sup> (With thanks to the user ‘kuk’, for the foundational code to process MIDI input.) I have included in-line comments, where appropriate, to explain the function of notable portions of code.

```
byte incomingByte;
byte note;
byte velocity;

int action = 2; // A means of storing the current note state (1 = note-on,
0 = note-off, 2 = nothing has happened).
int count = 0;
int interval = 10; // How long we want the solenoid to be firing for.
int intervalLED = 10; // How long we want the MIDI activity LED to blink
for.
int pinArray[] = {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14}; // Our
solenoid output pins, in array form.
int statusLED = 15; // MIDI activity LED.

long previousMillis[14] = {0}; // The solenoid timer, which checks how long
each solenoid has been active against the interval set above.
long previousMillisLED = 0; // The timer for the MIDI activity LED.

void setup() {
  pinMode(statusLED, OUTPUT); // Declare the status LED pin as an output.
  for (count = 0; count < 13; count++) // Count 13 pins ready to declare
their function (ins or outs).
    pinMode(pinArray[count], OUTPUT); // Declare all the solenoid pins in
the array as outputs.
  Serial.begin(31250); // Set the serial baud rate as per MIDI spec.
  digitalWrite(statusLED, LOW); // Ensure the MIDI status LED is off to
begin with.
}

void loop () {
  if (millis() - previousMillisLED > intervalLED) // If the MIDI LED has
been on for longer than the LED interval time, then turn it off.
    digitalWrite(statusLED, LOW);
  if (millis() - previousMillis[2] > interval) // If the solenoid has been
on for longer than the interval time, then turn it off.
    digitalWrite(2, LOW);
  if (millis() - previousMillis[3] > interval)
    digitalWrite(3, LOW);
  if (millis() - previousMillis[4] > interval)
    digitalWrite(4, LOW);
  if (millis() - previousMillis[5] > interval)
```

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<sup>344</sup> <<http://www.arduino.cc/cgi-bin/yabb2/YaBB.pl?num=1187962258/0>> (Accessed 29th September 2010).

```

    digitalWrite(5, LOW);
    if (millis() - previousMillis[6] > interval)
        digitalWrite(6, LOW);
    if (millis() - previousMillis[7] > interval)
        digitalWrite(7, LOW);
    if (millis() - previousMillis[8] > interval)
        digitalWrite(8, LOW);
    if (millis() - previousMillis[9] > interval)
        digitalWrite(9, LOW);
    if (millis() - previousMillis[10] > interval)
        digitalWrite(10, LOW);
    if (millis() - previousMillis[11] > interval)
        digitalWrite(11, LOW);
    if (millis() - previousMillis[12] > interval)
        digitalWrite(12, LOW);
    if (millis() - previousMillis[13] > interval)
        digitalWrite(13, LOW);
    if (millis() - previousMillis[14] > interval)
        digitalWrite(14, LOW);

    if (Serial.available() > 0) { // If we receive MIDI information, then
        blink();
        incomingByte = Serial.read(); // Read the MIDI input and store it as
        the 'incomingByte' variable.
        // First we wait for the status byte.
        if (incomingByte == 144) { // If the incoming byte is a note-on
            message, then set the action variable to '1' for further checks.
            action = 1;
        }
        else if (incomingByte == 128) { // If it's a note-off message, then set
            the action to '0'. Set to '2' if you wish to ignore note-off messages
            (useful for timed solenoids).
            action = 0;
        }
        else if (incomingByte == 208) { // For aftertouch.
        }
        else if (incomingByte == 160) { // For Poly pressure (i.e. polyphonic
            aftertouch).
        }
        // Then we wait for the data byte.
        else if ((action == 0) && (note == 0)) { // If a note-off is received,
            but no note number, then wait for a note number.
            note = incomingByte;
            playNote(note, 0);
            note = 0;
            velocity = 0;
            action = 2;
        }
        else if ((action == 1) && (note == 0)) { // If a note-on is received,
            we wait for the note number.
            note = incomingByte;
        }
        else if ((action == 1) && (note != 0)) {
            velocity = incomingByte;
            playNote(note, velocity);
            note = 0;
            velocity = 0;
            action = 0;
        }
        else { // If no serial information has been received, do nothing.
        }
    }

```

```

    }
}

/* Function to blink the MIDI activity LED */
void blink() {
    digitalWrite(statusLED, HIGH); // Blink the MIDI activity LED.
    previousMillisLED = millis(); // Reset/sync the MIDI activity LED timer.
}

/* Function to play the correct MIDI note */
void playNote(byte note, byte velocity) {
    int value = LOW;
    if (velocity > 0){
        value = HIGH;
    }
    else {
        value = LOW;
    }
    if (note >= 36 && note <= 48) {
        int myPin = note - 34;
        digitalWrite(myPin, value);
        previousMillis[myPin] = millis();
    }
}
}

```

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