Towards Abstraction: Aesthetics, Institutions and Acousmatic Composition

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ABSTRACT

This work aims to explore the relationship between institutions, aesthetics and acousmatic music. It highlights how important academic institutions are to the development of electroacoustic music in the UK, and establishes the benefits of being attached to an institution as an electroacoustic composer. An in-depth discussion of the aesthetics of acousmatic music follows, aiming to establish what it is that makes acousmatic music aesthetically valid, and how this view may vary from one institution to another. How institutions directly influence composers' work through community and facility is of particular interest. The work concludes with a discussion of my own recent compositions, and how they exemplify what I have ascertained about the interlinked nature of institutions and aesthetics.

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Introduction: Prelude to the Community

My MMus study in at the University of Sheffield resulted in a strong compositional output. Having completed this one-year programme, I produced 50 minutes of music. I attribute this creative period to a number of things; stimulation by new equipment, a new environment, and a build-up of ideas over a vacation period. However, I feel that a vast portion of a successful compositional output, as an acousmatic composer, revolves around the community of people involved in the discipline. It is widely acknowledged that in electroacoustic communities, it is not merely composers who play a part in the development of the field; software developers, DJs, improvising musicians, live-laptop artists and engineers all contribute to the development of the electroacoustic genre.

The University of Sheffield's electroacoustic community, based in the Soundhouse Studios, contains a vast wealth of knowledge. My colleagues have designed new processing tools, mixing interfaces, audiovisual environments in addition to composing new acousmatic music. It is the trade of ideas in a studio environment (which often leaves one in a well-soundproofed room, on one's own, for long periods of time) that stimulates and enhances compositional productivity. As opposed to my undergraduate study, in which I was at a different institution (The University of Manchester), using mainstream closed-source software, I have found it exciting, and also a challenge, to be using brand new processing tools; a change of working method assisted me in keeping my music sounding fresh.

This change of institution and all that goes with it, including the new community, software, studios, loudspeakers and diffusion concerts, has influenced my compositional aesthetic. This is something that has occurred somewhat gradually; trying to carry an aesthetic from one institution to another was something that, at the start of my postgraduate study, I wanted to achieve. This proved problematic; I was trying to recreate a compositional mindset that revolved around an environment, toolset and community that I no longer had access to. It has taken me some time to acknowledge that it is okay to 'let go' of that frame of mind, carry some compositional ideas through from that period of time, and then to allow oneself to be influenced by a new community's approach. This can be a somewhat difficult idea to grasp for the acousmatic composer (or the composer in general), as the way we operate often has a strong element of personal control in it, due to the isolated nature of composition. I will be exploring how my approaches to sound recording, sound manipulation, musical structure and musical gesture have changed across the course of this postgraduate study.

This thesis also aims to delve deeper than merely the change in my personal compositional aesthetic between one institution and another. I shall be seeking to explore why institutions are important in the creation and dissemination of electroacoustic music, with particularly strong reference to acousmatic music, and highlight some of the positives and negatives of the discipline being housed in universities in the UK. With many prominent electroacoustic music composers in Britain today located in universities, it seems a pressing issue to discuss the sociological impact that academic institutions have on students of electroacoustic music. It is also worth considering the impact of institutions on composers and lecturers in the discipline and the way they affect the dissemination of work. The sociological element of institutions, as well as the notion of community, has not been adequately represented through the literature available. Research tends to be technology-based,

though there do exist a number of important texts on aesthetics.[1] However, more researchers now recognise the social and cultural impact of the modern academic unit on the electroacoustic genre and its composers.[2] Consider the existence of places like De Montfort University, Leicester; their department for Music, Technology and Innovation houses around a dozen staff, all practically dedicated to some aspect of electroacoustic music. The Sonic Arts Research Centre, based at Queen's University Belfast, also houses nearly a dozen electroacoustic staff. Related to my discussion of the aesthetics of the genre is a need to try to establish what is considered 'good' acousmatic music, discussing compositional methods and how 'good' might differ from one institution to another. At present, I do not feel that the aesthetics of the discipline have been written about adequately, and it is important to discuss what composers are doing today that makes their music valid and respected by other composers. Use of recording techniques, compositional processes, and musical structuring are all important, but the sound materials themselves and how they are treated seem a crucial part of the aesthetic validity of a piece of electroacoustic music. The aesthetic nature of real-world and synthetic sound is a particular boundary I have come across, and it seems to divide opinion between composers. It is something I have tried to address in my own recent music. This all builds in to my final chapter, where a discussion of my own compositions highlights the intertwined relationships between institutions and aesthetics.

[1] Simon Emmerson's seminal edited collection, *The Language of Electroacoustic Music,* Macmillan Press, 1986, was a key aesthetics text when first published and still is today.

[2] Elizabeth Dobson, a researcher at the University of Huddersfield, presented a paper entitiled '*studio based composers in collaboration: a socioculturally framed study'*. It was the only paper presented at ICMC 2011 to reflect on modern-day institutional impact on compositional collaboration.

Chapter 1

Why Are Institutions Important for the Development of Electroacoustic Music?

A few problems arise when discussing 'institutionalised' music in universities. It is easy to demonise institutions when referring to the creation of music; music composition is seen as a highly individual, creative concept, and thus it seems terribly strange to many people, even some musicians, to comprehend that composers can write their music in a university, often on a similar degree course to other musicians. Those familiar with classical music understand that composers such as Bach, Mozart, Beethoven, Berlioz, and Wagner wrote their music in isolation, at a desk, more than likely in their own home. This was the norm. This was seen as the norm. The members of the Second Viennese School, who revolutionized the way music was thought about and composed via twelve-tone techniques, were still 'at the desk, at home' composers. The idea of a composer becoming an individual creative artist while at an institution seemed farfetched.

Secondly, the interdependence between academia and composition can seem confusing. The confusion often has to do with the nature of research. A PhD, the highest research degree and one which many electroacoustic composers obtain, should result in *an original contribution to knowledge*. Knowledge, and academia as a concept, are both viewed as terms in which the material referenced is concrete, and in some way useful to society, and/or available in script form, such as a book or journal article. Composition does not really reflect this, yet it does fit in to this 'research' bracket because of it being entirely original at the point of creation. In some ways, composition often best embodies the ideas of musical research in that it creates fresh questions about what music actually is. Electroacoustic music brings this issue up frequently due to its use of real-world sound sources and new technologies. It is completely unavailable in script form,[3] with the exception

[3] Trevor Wishart, in *On Sonic Art*, discusses music's historical over-dependency on script (notation and scores).

of graphic scores.[4] Academia often constitutes the use of scripts (books, scores, journal articles) for research and analysis. However, non-script based music provides a useful paradigm shift for how we understand academic research.[5] Composition can clearly be research, but its primary audience is the concert-going or record-buying public, not other academics.

Composition in academic environs is also viewed as negative by those who accuse contemporary music of seeking safe ground in universities, where the music can thrive and develop because it is not threatened by widespread public misunderstanding and disdain. This was an idea initially proposed by Milton Babbitt, and discussed in Georgina Born's *Rationalizing Culture*.[6] The idea of contemporary music being inaccessible is perpetuated by the academic institution's role in its existence – suggestions that this music that is only understood by a minority of *intelligent* people, the compositional 'ivory tower'. To some extent, this is applicable to electroacoustic music. It is by no means an easily accessible art form.[7] In this context, I refer to electroacoustic music as music that bases sound as key musical material and music that explores the creative use of electronics with or without live instruments. This includes subgenres such as acousmatic music, live & interactive music and soundscape composition. Acousmatic music refers to music on fixed-media formats, either stereo or multi-channel, that is written for performance in concert diffusion. The work of John Young (*Pythagoras' Curtain,* 2001)*,* Jonty Harrison (*Internal Combustion,* 2006) and Denis Smalley (*Base Metals, 2001*) are all reference points for the genre. However, institutions play a huge part in its existence more due to facility than accessibility; they provide the space and equipment to compose.

[4] Unlike conventional scores, these are often created post-completion of the artistic work, and are descriptive, not prescriptive.
[5] It has already been acknowledged by Landy (2007) how non-script based compositions have changed the way we view musical analysis.
[6] Georgina Born, *Rationalizing Culture*, 1995, University of California Press
[7] Activities and research projects such as the *Sound Organizer* software (unreleased) are attempting to increase accessibility.

Unlike instrumental music, where one always has the option to compose on one's own at a desk, for many electroacoustic composers this is simply not possible. A large quantity of high-end, hi-fi audio equipment is needed, such as studio-grade speakers. Fast, powerful computers with mixing software, plug-ins, a patch-bay for multi-channel work, as well as an analogue mixing desk should be considered essential. This equipment takes up a lot of space, and on top of this tends to be expensive. The financial element is somewhat superficial when one considers paying tuition fees in order to use a University's studio facilities and be taught how to use them (you could probably buy a lot of equipment of your own for the same money) but it is still unlikely that a person would have a large-sized, reasonably well sound-insulated room that wouldn't disturb any neighbours! The real-time processing element of generating electroacoustic material means that levels of noise can be relatively continuous for long periods of time. It is preferable to have studios, like those in universities, where rooms are well sound-proofed and others are not disturbed by compositional work. Problems of space and expense are not new; Christian Zanési, when discussing studio resources with regard to the creation of the GRM, states:

> *In the 1950s and up to the 1970s the thinking was that the justification for this type of institution was the scarcity of resources of production. They were so expensive that only a few enterprises could afford to acquire them, and these for the majority were in the public sector, such as the broadcasting bodies.*[8]

In the latter half of the twentieth century, due to technology being far less accessible than it is nowadays and much less compact, it is easy to imagine that the problems I have outlined were far greater. This notion is compounded by the above Zanési quote, and undermines the notion that electroacoustic composition is impossible outside of an institution when equipment is much smaller than it was in the 1970s, for example. However, despite the fact that the equipment is now smaller and more accessible than the previous decades (and that most people interested in the discipline in

[8] Christian Zanési and Evelyn Gayou, *A house of composers,* Organised Sound (2007), 12: 277-278, Cambridge University Press

the twenty-first century own their own computer), the need for institutional housing of studio facilities is by no means redundant due to the community aspect of electroacoustic composition.

It is not only institutional space and the equipment for composing that are important for electroacoustic composers and housed by universities; means of dissemination are also vital. Academic institutions, already pre-existing networks of interest, communication and dissemination often house diffusion systems for the performance of electroacoustic music. This includes Manchester, which houses MANTIS, now a 56-channel diffusion system; Queen's Belfast, which houses the Sonic Lab in SARC, a 48-channel hemispheric diffusion system; Birmingham, with BEAST, now a 96-channel system; and Bangor University, containing Electroacoustic Wales, a 32-channel diffusion system. Music conservatoires in the UK, with the exception of one,[9] are not so well equipped for the composition or dissemination of the genre.[10] Conservatoires have tended to provide adequate music technology facilities for the production of music for film and television.[11] This is likely to be tied up with the desire of music colleges to see their students as commercially successful. However, a serious electroacoustic composer is unable to properly assemble or disseminate his/her music via these prestigious institutions.. This brings about a strange breakage of a social paradigm; on the whole, encouraged by media coverage of classical artists and music magazines, people believe that to be successful as a musician, and by extension as a composer, one should aim to attend a music conservatoire. This is probably compounded by the mistaken view that creative music making is not studied in HEIs.[12]

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[9] The Royal Scottish Academy of Music and Drama's electroacoustic division, under the direction of Alistair MacDonald, is at the forefront of the UK's electroacoustic music scene and has produced an array of accomplished composers.

[10] The Royal Academy of Music possesses one studio with 5.1 monitoring, more geared to commercial output but potentially usable for electroacoustic composition. It can be viewed at http://www.ram.ac.uk/lg57, accessed September 30 2011.

[11] The Royal College of Music in London provides a film and television composition course, and a studio, but is not equipped for the production of the highest-quality electroacoustic music, despite employing a staff member who teaches it. Their studios page can be viewed at http://www.rcm.ac.uk/life/facilitiesresources/rcmstudios, accessed September 30, 2011.

[12] Higher Education Institutions.

On top of academic institutions enabling the creation and performance of this music, it is also the community that plays a key aspect in the genre's existence. The paradigm of the classical composer working on his own seems unworkable considering the scale of musical collaborations that began to throughout the latter half of the twentieth century. One of the most well-documented examples of an electroacoustic community was IRCAM (Institution de Recherches Coordination Acoustiques/Musiques), founded by Pierre Boulez in 1977 and well-funded by the French state. It was IRCAM that enabled musicians, composers and scientists to collaborate on compositions that often included an electroacoustic element. Boulez, in 1976, stated:

> *The creator's intuition alone is powerless to provide a comprehensive translation of musical invention. It is thus necessary for him to collaborate with the scientific research worker in order to envision the distant future, to imagine less personal, and thus broader, solutions…*[13]

IRCAM is an early incarnation of what I view as an electroacoustic community; a group of people working towards a goal of merging music and technology in a congruent fashion, disseminating musical outputs at the end of most collaborations. Obviously, times have changed since the 1970's. The distinction between composer and 'scientist' has been blurred. Many composers, even those not involved in the electroacoustic discipline, are able to operate equipment used for music technology purposes to some degree. When IRCAM was founded, scientists were present to do all the technological work, whereas the composer was in place to generate creative ideas, with computers and musicians as a medium for expression. As a result, the electroacoustic community in the modern day is often a group of people who would potentially brand themselves as composers or software engineers, but are in fact proficient in multiple aspects of electroacoustic practice. This is not to say it is necessary to be highly proficient at both to engage in the discipline; being an excellent programmer with a moderate interest in composition or a composer who uses newly developed software and gives feedback, thus aiding software development, are both equally useful. Without

[13] Requoted from Georgina Born, Rationalizing Culture, 1995, University of California Press

what Boulez refers to as ‘scientists’, the available tools to construct electroacoustic music would never increase, thus preventing diversity. However, without composers, there is no artistic result, and the scientific work falls back into computer science, a different discipline. The combination of both composers and scientists enabled art and computer science to tread new ground.

What has not changed since the creation of IRCAM is the notion (in itself) that a community can encourage and enhance creativity. The regular sharing of musical ideas on a daily basis, by attending an institution and using facilities in which others are present, enables a near constant ability to be able to listen to or see what a colleague is doing. For an instrumental composer, this might entail other composers being able to see their scores and provide comment. With the acousmatic composer particularly in mind, who works primarily in fixed-media (CD) in either stereo or multi-channel formats, it enables other composers to hear, immediately, what one has created via playback on the institutions’ studio facilities. This enables rapid feedback and exchange of ideas, which are, in the short and long term, likely to help shape the piece. This process does not result in one sacrificing one’s own artistic voice; as a result of regular interaction and the auditioning of one’s own compositions to others, it should be seen more as an ‘icing on the cake’ than a base level of instruction. Anyone already composing should have some idea of how they want to progress with their own compositional style, and thus daily feedback or criticism can be taken on board when trying to shape one’s own music. Thus, unlike the 1970s in IRCAM, during which a composer’s idea was realised by scientists as ultimately a *collaborative work*, the modern day electroacoustic composer will have composed an *individual work* that is bolstered by frequent interaction but not necessarily collaboration. The ability to collaborate equally on projects with other like-minded individuals is yet another bonus of being a composer in an institution.

The Groupe de Recherches Musicales (GRM) must be acknowledged in this chapter; this Paris-based institution could be said to have made the most impact on acousmatic music in the latter half the twentieth century. The GRM is important because, from its inception in 1957, its research focus was

based around acousmatic sound (unlike IRCAM) thanks to its founder, Pierre Schaeffer, an early pioneer of *musique concrète*, which is most closely associated with modern-day acousmatic music. Established in 1951 as the GRMC (Groupe de Recherche de Musique Concrète) by Schaeffer, who also founded the Studio D'Essai[14] nearly a decade earlier in 1942, the GRM proper was brought into existence in 1958. Marc Battier notes 'the remarkable unity of the GRM'.[15] The GRM has created a great example of *externalised collaboration*, with the creation of GRM Tools[16] and the running of courses for amateur composers at the institution itself.[17] Christian Zanesi speaks of 'a philosophy of work that runs right through the history of the GRM: from the start, the studios and the tools have been constructed in a fashion that enables the musician to be autonomous very quickly and to work alone'.[18] This is contradictory to the IRCAM idea of the necessity of internal scientific collaboration to achieve an artistic goal. These early GRM developments towards easy-to-use composer-based tools paved the way for the modern GRM Tools,[19] used the world over by electroacoustic composers and sound designers. The GRM was focused towards the composer – a necessary focus for the production of acousmatic music at this point in time. Interestingly, Bernard Parmegiani was originally brought in as an engineer, as engineers were required to enable compositional functionality, and is recognised today as a key figure in the history of the GRM as a composer.

A huge paradox arises in the teaching of electroacoustic music in some UK universities. Many institutions that teach the discipline (as well as those that don't) tend to see music degrees as something that should be primarily based around western classical music. As a consequence, many

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[14] The Studio D'Essai, otherwise known as the Club D'Essai, was where Schaeffer recorded his first work, and where other composers around Schaeffer interested in experimental music also worked.

[15] Marc Battier, *What the GRM brought to music: from musique concrète to acousmatic music,* Organised Sound (2007), 12: 189-202, Cambridge University Press

[16] GRM Tools, accessed and purchasable via http://www.inagrm.com/accueil/outils/grm-tools, accessed September 30 2011.

[17] Francois Delalande, *The technological era of 'sound': a challenge for musicology and a new range of social practices*, Organised Sound (2007), 12: 251-258, Cambridge University Press

[18] Christian Zanesi and Evelyn Gayou, *A house of composers,* Organised Sound (2007), 12: 277-278, Cambridge University Press

[19] GRM Tools, accessed and purchasable via http://www.inagrm.com/accueil/outils/grm-tools, accessed September 30 2011.

students who attend these institutions are already classical musicians, who may well have been performing on their instruments for many years since childhood. Although it seems that the social paradigm of a music student at a university is one with an 'open mind', as opposed to the stereotypical conservatoire student who practises his instrument and opts out of exploring music, in my personal experience this can be far from the case. With an institution that recruits classical musicians, who attend with a desire to learn about classical music, and who are used to script-based musical activity, it can seem like there is a disconnect between the rest of a classically-based music degree and the discipline of electroacoustic music. One might consider the stereotypical naïve music student as having a 'closed mind' being fixated upon instrumental practice of the 18th and 19th centuries and being tied too dogmatically to notation. Wishart, in *On Sonic Art*, highlighted the mutual existence of music and notation, by which up until the existence of musique concrete, music existed first on paper and subsequently in performance.[20] As electroacoustic music, especially acousmatic composition, ignores this convention entirely, it can be difficult for students to grasp how electroacoustic composition fits in to music as an aesthetic whole, given there is no visual element (scores and human performance). The ability of a student to recognize real-world sound as music can also be difficult, given the life-long association of music as exclusively instrumental.

Furthermore, a classically-trained musician will have almost exclusively experienced music performed on instruments, and loudspeakers as a sound reproduction device. To re-assert the importance of the loudspeaker involves understanding that loudspeakers could also form an 'orchestra' as a performance collective.[21] Moreover, pre-university teaching in this country fails to acknowledge electroacoustic music. The current A-level in music avoids the term, using instead 'experimental' music. A-level music technology focuses on recording and mastering techniques, undermining the experimental nature of electroacoustic music and instilling the music technology as

[20] Trevor Wishart, *On Sonic Art*, 1996, Harwood Academic Publishers
[21] 'BULO', or the Bristol University Loudspeaker Orchestra, gains its title from this notion.

functional and not creative. It may be beneficial in the long run to integrate the music into the school curriculum from an earlier age, and thus make the transition to learning it in a higher education institution easier. This would result in greater uptake of electroacoustics in these university institutions, which is often very small considering the number of students in each year. My criticisms make it seem as if classical training is in some way at fault for the lack of interest in electroacoustics by university level. However, this is not to say popular musicians are at a huge advantage. Despite having a greater understanding of how music does not need to be score-based, and understanding more about technology due to the inherent relationship between popular music and recording, popular musicians are sometimes disadvantaged by the lack of experience of contemporary western art music (often arhythmic) which classical students are likely to gain from hearing composers such as Ligeti, Boulez, Stockhausen, Cage among others. This lack of arhythmic experience may hinder students at popular music and music technology departments in understanding electroacoustic music; further research could be done to investigate this notion.

Despite the challenges of placing electroacoustics within the music degree, many academic institutions in the UK continue to provide a high-quality breeding-ground for the creation and dissemination of the discipline. Recently, two composers who worked at the University of Sheffield's Sound Studios (Louise Harris and myself) had works selected by the British Section of the ISCM (International Society for Contemporary Music) for potential inclusion in World Music Days 2012, Flanders. Manuella Blackburn, a PhD graduate of the University of Manchester, was twice a prize-winner of the international Musica Viva Electroacoustic Music Composition Competition. Louise Rossiter, a student at the University of Edinburgh under Robert Dow has been selected for performances at International Electronic Music Week, Shanghai, as well as New Adventures In Sound Art, Toronto, Canada during MMus study. Students of Denis Smalley at City University London, such as Peiman Khosravi (finalist of Prix Destellos), Erik Nystrom (Prix de Public, Metamorphoses 2010,

Belgium) and Adam Stansbie (finalist, Citta di Udine Composition Competition, Italy) have all gone on to be hugely successful composers; these are just some of the many accolades and prizes they have received. The UK is recognised world-wide as housing the greatest density of institutions where electroacoustic music can be studied.

Chapter 2

Sound Thought: What are the Aesthetics of Acousmatic Music?

With an entire planet of sound to record at our disposal, new processing tools constantly emerging, and somewhat less rigid established frameworks about how acousmatic music can be constructed in an aesthetically valid fashion, the possibilities for decision-making in the construction of acousmatic music can be almost endless[22]. Unlike the instrumental medium, where a string quartet bonds a composer to four instruments each with their own sound worlds, acousmatic composers can not only record these instruments and use them in their raw form, but also draw on natural sound sources. Also, processing techniques show more evidence of development[23] than say the use of *sul ponticello* and *multiphonics* in the instrumental medium which evolve at a slower rate, mainly when a contemporary music performer finds a new method of producing these techniques or a new technique altogether. It is good practice to leave traces of the original recorded source material, but create an individual sonic environment for each acousmatic work; what sounds does the piece revolve around, and how do they develop? Adam Basanta's composition *…a glass is not a glass…* is an excellent example of this modern acousmatic aesthetic; clear sound source, subtle processing, clear acknowledgement by composer and listener of real and non-real sound worlds.[24] It is also good practice to use a variety of processing tools to create a piece of acousmatic music, but for the most part, a piece should not be 'about' the techniques; they are, in all likelihood, audible to the moderately experienced electroacoustic listener, but an acousmatic composition should be about the development of sound and not the development of a computational compositional technique. These notions will be discussed further in this chapter.

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[22] John Young, Practice, Process and Aesthetic Reflection in Electroacoustic Music, *Organised Sound* 12:1, p1, Cambridge University Press.
[23] Development of two new granulation tools occurs at University of Sheffield, 2010-2011.
[24] Adam Basanta, *…a glass is not a glass…*, unpublished work, 2010.

Opinion between acousmatic composers is divided over the use of synthetic sound; this is evident in the music.[25] First, I must define my use of the term synthesis in this context. Here, I refer to synthetic sound as that which has no reference to the real world whatsoever, and is generated entirely using computers or analogue synthesizers. Use of synthetic material can range from the fairly subtle to the very obvious. I would describe a subwoofer-frequency bass drone in the context of an acousmatic mix as a subtle use of synthesis. As much as the actual resulting sound may not be particularly subtle (due to volume), the compositional use of the sound is, because there is no possibility it can interfere with the listener hearing processed real-world sounds (the registral difference would be huge, even if a real-world sound was pitch-shifted to the lowest register in which its original sonic qualities were still detectable). It may also seem subtle because it is difficult to imagine a real-world sound of such low pitch being recorded. It is difficult to record a 37Hz bass drone; this may involve being near some industrial machinery. In addition, some composers seek to transpose sounds down in pitch-shift software so heavily that their original source-bonded sound attributes have been lost. The composer may have fulfilled his desire to avoid use of synthetic sound, but has achieved the same effect regardless. Finally, this use of synthesis may seem subtle because it is very commonplace in acousmatic compositions in this day and age, regardless of whether the specific piece focuses on real-world sound or synthetic sound. The use of subwoofers in studios and diffusion systems means that, when composing for diffusion, the creation of an immersive sonic environment can often revolve around such a synthetic drone.[26] Acousmatic composers, on the whole, have come to see low-frequency synthetic sound as an aesthetically valid part of the music. This type of sound is often found in cinematic sound-design; music for cinema is another key influence for the acousmatic genre.

[25] The music of John Young, Robert Dow and David Berezan avoids any use of synthetic sound. The music of Adrian Moore, Andrew Lewis, Laurie Radford and Paul Dolden is more embracive of the technique.
[26] Robert Sazdov, *The influence of sub-woofer frequencies within a multi-channel loudspeaker configuration on the perception of spatial attributes in a concert hall environment,* ICMC 2011 Conference Proceedings.

Synthetic sound becomes more controversial when we get further up the frequency spectrum. First and foremost, we have the registral clash with recorded and processed sound; the argument from the synthesis-sceptic acousmatic composer would be 'why use synthesis when I can use real sound?' This is the argument I would have put forward during my attendance at the institution where I received my initial studies. Since my studies elsewhere, I cannot support this argument in full. Mixing real and synthetic sound can create new, hybrid sonic textures that help continue the development of the genre by creating new sound-worlds. This has been achieved by composers as far back as Karlheinz Stockhausen's *Kontakte* (1960), as recent as Ambrose Field's *Being Dufay* (2010) and my own work *Reflux* (2011). However, synthetic sound also helps alleviate some aesthetic problems that arise from pitch-based processing of real sounds. Often, the processing of sound up or down in pitch, most notably the voice but also extending to more generic sounds such as door creaking, can be seen as aesthetically unpleasant by acousmatic composers. This processing can come across as ridiculous due to cartoon-like references for the listener and composer. Synthetic sounds, when pitch shifted, are unlikely to elicit ideas of the ridiculous or humorous, due to their lack of source-bonding and thus inability to reference real human memory, but this is not to say it is not possible. Timbral qualities of a synthetic sound may be humorous and thus achieve the same effect, whether desired or not.

Synthesis techniques should remain aesthetically valid based on existing concepts of emotional communication in instrumental music. There are a number of interesting parallels between computer synthesis and the synthesis achieved by the abstract combination of instrumental sounds. If a modern composer were to write a string quartet and wanted to elicit an idea of claustrophobia, they may well choose to use long, drone-like chromatic cluster chords, which they think sounds claustrophobic. The same can apply with synthetic sound material in acousmatic composition; an extensive, dark, somewhat clustered synthetic chord with the treble frequencies filtered out may

induce the same emotional effect. A counter-argument to this use of synthetic sound as aesthetically valid may be that it is in fact organised pitches that are the dominant factor in eliciting emotion and not the sound; that the chromatic pitches contained in the synthetic sound are eliciting the emotion and not the sound itself. I suggest that it is the colour of the sound as much as the pitches it contains that aids emotional communication; a bright, treble-heavy but bass-reduced chromatic chord is less likely to induce claustrophobic thoughts than a dark, mid-range and bass-focused synthetic chord that is only based on a sine tone with little harmonic interest. In my 2011 composition *Reflux*, the piece opens with a giant glissandi motion, which is entirely synthetic. The opening is intended to represent a musical motion for acid reflux. The overall dark colours of the synthetic sound aid the glissandi effect in the communication of a 'gurgling' idea. My compositional research, that is, the creation of acousmatic music, in this piece demonstrates it is colour and overall register rather than specific pitch that makes the sound interesting, and therefore asserts the validity of my use synthetic sound. At no point would processing a real sound to that pitch and then adding the same level of glissandi have improved the communication of this idea, and due to the great density of the synthetic material, (generated with Iain McCurdy's wavelets algorithm)[27], use of real sound may have been detrimental. This notion of synthetic material emotion communication would contribute towards development in the Intention/Reception Project as developed at De Montfort University.[28]

Although synthetic material is valid in its own right, its potential to be laden with pitch makes it a versatile way to introduce pitch, particularly chords, into a piece of acousmatic music, an idea I have highlighted in my works *Ultraviolet* (2010) and *Reflux* (2011). Tonal or modal chords can be stacked onto synthetic sound via many computer processes including comb filtering, resonant filtering and

[27] Iain McCurdy, Csound Tools, accessed August 8 2011 at http://iainmccurdy.org/csound.html
[28] Leigh Landy, *Intention/Reception Project* (2006). Publ.: in Mary Simoni, ed. Analytical Methods of Electroacoustic Music. Routledge (NY): 29-53 + appendix on DVD.

pitch shift. The first work from Monty Adkins' most recent work, *Remnant,*[29] from *fragile.flicker.fragment* (2011) demonstrates this; he generates most eloquently chordal material without using a conventional instrument with which chords are associated. There is an association of lush, chordal synthetic textures appealing very much to the sound art world but less so in the traditional acousmatic domain, in which those sorts of sound materials would be viewed as works of *sound art*, possibly verging more towards *commercial experimental electronic music* but not 'serious' acousmatic music.[30] Indeed, aesthetic differences between subgenres need to be disregarded somewhat; use of tonal material is something which, in synthetic form, still can seem quite new, unlike in avant-garde instrumental composition, in which tonality is considered outdated if used for extended passages, and tonal highlighting is frowned upon. It would be a shame to apply the same constrictions to acousmatic music with the view that organised pitch could be seen as aesthetically invalid due to its associations with *installation art* and *commercial electronic music.* I have confronted this in my own compositional development. In *Grayscale Confessions* (2010), I used piano chords as a focal point, but later considered them to sound too weighed down by classical tradition; the piano's prevalence as an instrument in the classical domain made me think the piece, in retrospect, was referencing far more music than I desired it to. In *Reflux* (2011) and *Return to Sender* (2011), I constructed chords with synthetic sounds and filtering techniques, thus introducing some inferred tonalities seemingly without the associations of classical tradition. I consider that synthetic material can be seen as aesthetically valid in the acousmatic domain, and not just in the more commercial subgenres of electroacoustics.

However, an awkward middle-ground is brought up when discussing a very modern form of synthetic sound production; physical modelling. This is where algorithms are written in order to replicate the sound of real instruments and the real world. Stefan Bilbao of the University of

[29] Monty Adkins, *fragile.flicker.fragment.* (2011), AudioBulb Records, Sheffield, UK.
[30] Monty Adkins' work focuses on questions concerning audience and genre.

Edinburgh and Iain McCurdy, formerly of Queen's University Belfast, have both developed physical models. This sort of software development was hugely important in the 1980s and 1990s, in which digital keyboards with very little memory or processing power needed to emulate traditional instruments. The use of physical models currently sees infrequent use in acousmatic music. For example, Lee Fraser's recent piece, *Ply*[31] (2011), used physically modelled harpsichord sounds. In terms of a *computer music* ethos,[32] in which using technology from all different angles to create music from the ground up is desirable, the notion of physical modelling fits neatly into electroacoustics, due to the experimental use and development of physical modelling algorithms. However, from a compositional point of view, they could be seen as an aesthetically invalid compositional device, due to them being less musically effective than recording actual instruments. I consider them a good demonstration of software development, but are very niche rather than a multi-purpose sound processing tool, making them less useful in the broader spectrum of the development-composition paradigm. At this point in time, I have not heard a physical model of an instrument that has sounded as good as the actual instrument. With microphones capturing more detail than ever, an instrumental recording can be used in an acousmatic piece to expose hidden sounds especially when an instrument is close-microphone recorded. With the current inferiority of physical models to real instruments, I consider physical modelling to lie outside of my realm of currently employed techniques. Despite this, Lee Fraser's piece *Ply* could be seen to remain viable as a piece of acousmatic art as it opts to explore the sound-world of physically modelled harpsichords, bridging a gap between concept and real-time sound manipulation. The piece focuses on sound and process, not simply relying upon a technology to create the music.

[31] Lee Fraser, *Ply,* 2011, Performed at MANTIS Festival, Friday 10th June 2011

[32] 'Computer Music' refers to the outdated American ideal of electroacoustics that developed over the past half-century. This 'American' aesthetic was primarily concerned with sound synthesis and alrogithmic music.

This point about physical models brings up a broader point about processing in general, in the fact that for the modern acousmatic composer this revolves around personal aesthetic leanings, which are highly individual. Some composers feel much more comfortable when sounds are abstract, and the 'base level' of the piece sees the sound sources, on the whole, fairly blurred, a good case in point for the music of Adrian Moore or Laurie Radford. Other composers, for example Pete Stollery, see the average 'recognisability' of the sound sources at a much greater level, with processes being much more subtle. This is easy to see in Stollery's compositions …*Scenes, rendezvous…,* and *ABZ/A.*[33] However, ground rules for nearly all composers seem to apply. As I stated earlier, a piece should be about sound, and not technique. This in mind, one aesthetic rule is to not overuse one processing tool. For instance, granulation on 90 percent of sound materials, even if the piece was about water sounds, would be seen by other composers as a piece about granulation. Twenty years ago, with the newness of many tools, this 'piece-about-process' concept might have been more acceptable. However, there is also something to be said for under-processing. A piece with nearly no processed sounds might be branded montage, or musique concrète, which, with current musical trends and with the technology available, could be construed in a negative light. Compared to montage works and perhaps soundscape composition, acousmatic compositions are, with the current aesthetic trend, *expected* to provide some sort of new, augmented reality sound-world. A combination of recognizable processed sound, small amounts of raw sound and some synthetic material would seem like an ideal. Christian Bouchard's *Angle Mort* (2001)[34] is a great example of this. Some of the opening, glitch material sounds highly synthetic, near the end of the piece we hear the raw sound of a heart-rate meter and in between we are subjected to a mixture of processed and synthetic material.

[33] Pete Stollery, *Un son peut en cacher un autre,* Empreintes Digitales, 2006.
[34] Christian Bouchard, *Fractures,* Empreintes Digitales, 2004.

A further aesthetic issue that has arisen during my time as an acousmatic composer is the *real-life-experience* element of real-world sound material. I have suggested earlier that acousmatic composers regard their ability to use real world sounds to connect to a listener's past experience as a very significant point of contact with the audience.[35] McCartney states:

> *When we listen to a processed real-world sound, and recognize it as such, we regard the composer as 'doing' something to familiar material. Processing becomes an activity that guides, and changes, our previous understanding of the source; it offers an interpretation....In offering a new interpretation of something that, nevertheless, remains 'known' from reality, a real-world music invites us to deploy, and develop 'ordinary listening skills; it encourages us to feel that we are involved, and participating, in the creation of a story about real life. (1999, chapter 5)*[36]

This quote has been discussed by Landy in reference to the Intention/Reception project, based at De Montfort University, Leicester. However, it was not discussed for its aesthetic implications. It must be noted that the ability to create an acousmatic piece, based around a real-world sound, which may be left raw at some points and processed at others, is the fundamental idea behind the *sonic signature*[37] of an acousmatic piece. It could be said that it is processed real-world sound and not real-world sound itself that constructs the basis of an aesthetically valid acousmatic piece in the traditional sense. The ability to expand upon existing realities but still retain a point of reference for the listener is a fine balancing act, and it could be said that the ability of the listener to keep hold of a piece's *sonic signature* is a benchmark for its success. The prominence of real-world sound in soundscape composition promotes the idea of the mundane as art,[38] and may help develop people's every-day listening skills. An excess of raw sound material in an acousmatic work could move the

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[35] John Young, *Reflections on Sound Image Design in Electroacoustic Music,* Organised 12: 25-33, 2007, Cambridge University Press

[36] Quoted in Leigh Landy, *Understanding the Art of Sound Organization*, 2007, MIT Press.

[37] Term mentioned in Francois Delalande, *The technological era of 'sound': a challenge for musicology and a new range of social practices*, Organised Sound (2007), 12: 251-258, Cambridge University Press. Also, term mentioned in tutorials with Dr. David Berezan, University of Manchester. Noted by Bentall (2010) in discussion.

[38] Alexis Lloyd, *Performing the Mundane: Interventions in Everyday Life,* 2007, accessed 1 October 2011 at http://a.parsons.edu/~lloya465/art/everyday_life.pdf

piece away from the 'idealised' acousmatic. It is this genre division that highlights a slight paradox in McCartney's statement. The creation of a story about real life, in the easiest sense, occurs most lucidly in a soundscape composition, in which the listener can negotiate an aural real-world construct. Processed real-world sound in acousmatic composition does not always lend itself well to storytelling. In my 2010 composition, *Vanity Procedure*, the sounds of rustling paper bags and commercial drug packaging are used as both raw and processed sounds, but I do not think the narrative about vanity is clear without the programme notes. It is not the sounds themselves in the piece that complete a story, as they are slightly too mundane, although high in energy and detail. However, a different interpretation may be that McCartney's point is about the listener having the ability to create his own narrative, as she does use the words 'involved' and 'participating', which suggest just that. In which case, regardless of the mundane nature of the sounds I have used, they still contribute to an aesthetically valid artistic construct. One thing the piece certainly is not designed to do is to be, in any great sense, emotionally affecting. Instead, it serves to highlight the mundane, which Québécois composers such as Christian Calon and Claude Schryer have also mentioned, speaking of their pieces as "impressions of the city…on a normal day punctuated by unremarkable events."[39] The mundane as art[40] is prominent in electroacoustic music, and an idea I have explored in my works *Vanity Procedure* and *Reflux*.

Another aesthetic issue to consider is the use of space. Space, as a notion, is completely intertwined with acousmatic practice. From the earliest notions of spatialised performance, like Varèse's Poème électronique first performed in Brussels (1958), to ideas about stereo and multichannel spaces as highlighted by Smalley, and finally to modern processing technologies based around reverb to create artificial spaces. Space is, evidently, at the forefront of our considerations. Recording techniques also

[39] Leigh Landy, *Understanding the Art of Sound Organisation*, MIT Press, 2007.
[40] Alexis Lloyd, *Performing the Mundane: Interventions in Everyday Life,* May 2007, accessed online at http://a.parsons.edu/~lloya465/art/everyday_life.pdf, October 2011

reflect space; if a studio recording is undertaken, the choice of room used for recording is vital, and if a field recording is undertaken other practicalities come into play. We must first consider that recording sounds in a given space is the composer's decision, and thus an aesthetic question is posed. Recording a sound in the studio has the advantage of having a very low noise-floor, meaning finer details in a sound can be exposed. It also often enables a choice of microphones, whereas with portable recording equipment one does not have the luxury of choosing the microphones attached to the device. However, field recordings are more practical for large machine sounds, which would be completely impossible to do in a studio. Field recordings also allow a greater human relevance to be acquired – noises from the environment mean everyday life is captured, as opposed to a studio recording which can seem quite clinical. If a composer wanted to create more cultural meaning[41] in his or her composition, focusing on field recordings would be a good way of achieving this. However, background noise would normally be an inconvenience; highlighting one particular sound may well be impossible. In summation, detailed sounds are best captured in the studio, but cultural relevance is easier to acquire through field recordings. We tend to associate studio recordings primarily with acousmatic works and field recordings with soundscape works, but this is a broad statement; many acousmatic works incorporate large field-recorded sections (Stollery's ABZ/A being a strong example) even if soundscape works infrequently use studio recordings. In my work *Timpani of Rain (2011)*, from 00:01 to 01:30 and right at the end from 04:05 to 04:26, I attempted to remedy this by using field recordings in a predominantly dry, text-and-synthetic work.

Reverb can also be construed in a very negative light and is treated very carefully by acousmatic composers. This is mainly due to the space occupied by concert halls. Whenever a piece is performed in a diffusion concert, it acquires some of the reverberance of the hall. Thus, a piece that is already highly reverberant may not cut through as well in a reverberant space, and in turn some of

[41] The ability to connect with a listener through non-musical experience.

the piece's detail may be lost. The dryness of many modern acousmatic works is something I consider a positive aspect, and is supported by the notion of writing for diffusion. Many accept the paradigm that music should be written for performance and not for the studio; a work that does not carry well during diffusion due to use of compositional reverb is often disadvantaged. This notion would be negated if a piece was specifically written for a very dry concert hall or a small space or for studio listening only.

Recording sounds for an acousmatic work in a large, reverberant room would seem invalid, as the room would become a feature of the sound. It would seem aesthetically desirable for the sound to be recorded in a dry space in order to maximise its detail, and to stop the sound being associated with the space of a room. It is possible to capture the reverberant qualities of a studio room almost too easily by recording with a microphone further away from the sound than it ought to be. This occurred in a recording of a sound in my composition *Return to Sender* (00:55-00:58, 01:00-01:12). It is a feature of the first part of the piece, but it could be said that I constructed that sound source, and section as a whole, on a musically unsatisfying idea, as it should be the sound that is heard, and not the room. In this instance, microphones were spaced some distance apart to so as to capture a wide spatial motion, given the intense physical motion of that specific recorded sound. I now consider that recording sounds is an art form in its own right, and that recording must not be overlooked as the fundamental point for constructing a strong acousmatic work. It is a technique that I as a composer am still developing.

It is not only reverberant spaces, but also reverb algorithms that can detract detail from sound recorded in studios in an even stronger fashion, and thus detract from the *sonic signature* of a piece developing. One aesthetic goal of acousmatic sound is to treat the microphone as a *sonic microscope*, in order to capture details of sound that are only heard when the sounds are heard up close. Removing this detail by placing that sound further away in an unreal space is somewhat counterproductive to this goal. To get the most out of acousmatic composition and diffusion

performances, I suggest that reverb should be used in subtle fashions to enhance spatial transitions, or to clearly acknowledge the movement of a sound back or forth in a virtual space, but should not be overused in the piece.

Chapter 3

Institutional Space

Many terms were coined by Smalley to elaborate on his ideas of spectromorphology.[42] These included *zoned* spaces, to describe specific areas of sound within a stereo window, *mechanised* spaces, to describe areas where a lot of machinery or technology exists, thus creating a great deal of mechanical sound. Development on these terms has also occurred, for example in my own 2010 paper[43], I coined *restorative* space, which is where a sound environment that was heard by the composer is recreated by using processed and synthetic sound, an expanded notion of artificial soundscape composition. More recently, I have come to understand a concept which I term *institutional space*.

This is a multi-faceted idea that, in all aspects, can contribute to a composer's compositional output and general aesthetic in some stance. The first aspect I must highlight is the performance of electroacoustic music. As I have previously stated, the number of institutions in the UK housing diffusion systems is very high compared to other countries. Many of these diffusion systems will contain roughly similar loudspeakers, often a combination of Genelec and ATC speakers. However, at no point will two different institutions have the same space in which the loudspeakers are placed for the construction of a diffusion system. Some institutions may be hiring a space in which to put on diffusion concerts, in which case an aspect of aesthetic taste (whether or not the concert producer likes that style of space) and also financial strain (whether or not the space is good value) may come into play. However, institutions may also have their own space in which to put on concerts, which

[42] Denis Smalley, *Spectro-morphology and structuring processes,* In Emmerson, S. (ed.) *The Language of Electroacoustic Music*. London: Macmillan: 61-93, 1986.

[43] Robert Bentall, *The composition and dissemination of space,* 2010, unpublished work. Available from Robert Bentall.

happens to be a convenient way to highlight an institution's work on a regular basis and place the institutional composer's works in the institutional space. This creates a strong sense of belonging for the composer and his work; the institution is keen to present the works that are created in-house. An added bonus is that it avoids the cost of hiring a hall and transporting loudspeakers. The institutional space may not have the perfect acoustic; in some instances, aesthetic preferences (dryness of hall) are put aside for convenience. Still, this does not undermine the importance of the institutional concert space and the regularity of concerts that can result.

Regardless of how the chosen diffusion space is acquired, it is something that many composers think about during the compositional process. The idea of writing for diffusion is a notion I have recently highlighted in my discussion of reverb, and its importance is obvious; music should have performance as its final goal. It is this statement that is a key factor in how composers may compose 'for a space'. For instance, the PACE building, the performance venue for electroacoustic concerts at De Montfort University, is a very dry space. Composing for this space as one's primary performance venue would lead one to consider using more reverb in a piece for several reasons. Firstly, the composer may know that the reverberant sound material will carry well in response to the dry space. Secondly, the composer does not like dry spaces, and is trying to compromise in his or her compositions by creating a 'wetter' in-piece atmosphere. Thirdly, it may be an aesthetic crux, in which a piece is designed to highlight an imagined space within a space. A state of flux occurs; a composer may avoid reverb due to a perceived aesthetic invalidity, but then reconsider using it to provide an aesthetic framework to compensate for a dry space they may not be used to. In conclusion, it can be noted that a diffusion space is likely to affect the way the compositional process is undertaken by the composer in order to come closer to his aesthetic goal. This problem does not just lie within reverb, and wetness/dryness. A large concert hall, such as the CBSO centre, recently

used to house BEAST[44] concerts, and the Cosmo Rodewald Concert Hall, the venue for MANTIS[45] concerts, both compromise small and quiet sound material, owing to this material getting 'lost' in the larger space.

The second facet of *institutional* space is the availability of studio environments. The importance of good studios is clear, but in my opinion, sometimes overstated. It is not necessarily about having every single piece of high-tech equipment available, but more about how comfortable the composer feels in working in a particular space. A positive psychological mind-set will be enhanced by the composer feeling 'at home' in the studios he composes in; different composers have different preferences for studio space. Some may prefer to work in a very small studio with a bare minimum of equipment, no analogue mixing desk and two speakers. Others may prefer to work in a larger studio, with more equipment at hand even if not required and multi-channel speaker arrangements, even when doing stereo work. The point is that a variety of studio spaces should be available for composers to work in, in shape and size. A smaller, less 'kitted-out' studio is by no means non-functional. The size of a studio is also likely to have some impact on the resulting piece. A small studio with small speakers may mean that a composer is, in distance terms, closer to the resulting sounds of the piece. More volume variation may be heard due to the composer's proximity to the loudspeakers, allowing the composer to include more extreme dynamics on the *piano* spectrum (*pp, ppp)*. Microscopic details may also be easier to hear (supporting the notion of the microphone as *sonic microscope*, and by extension including the loudspeaker in this bracket). In essence, a smaller studio may help a composer create a 'small' piece, which is an aesthetic crux in its own right. However, the piece may lose its character if a performance in a large classical concert hall occurred. A larger studio with the composer further away from the speakers may provide aesthetic positives from the other end of the spectrum. It is easier to hear how the work might sound in performance. It

[44] Birmingham Electro-acoustic Sound Theatre.
[45] Manchester Theatre in Sound.

may also be easier to test immersive sonic material more extensively in a large studio, as very loud extended passages of material will be painful and potentially damaging to listen to in a close speaker-listener environment. However, small details may be harder to hear. Despite this, composers do have imaginations, surprisingly enough; we are often capable of imagining the small in the large and the large in the small; composers can use their intelligence and ears to project their thoughts from the large studio to the small, or from either to the concert hall. Another aspect that must be considered is how the studios were built in the first place. Were the electroacoustic studios of the institution purpose built, or otherwise? Purpose-built studios will often offer carpeted walls and more thorough sound insulation. This is important, and the decision for a composer to attend one institution may well rest on this sort of factor; the presence of purpose-built electroacoustic studios may lend the composer to feel his discipline is being taken seriously at his institution of choice. The design of the studio may well even influence the sound of the work (volume, filter frequencies, equalisation) which is another contributing factor to an institutional sound. These factors highlight how the studio aspect of *institutional space* may influence a composer's aesthetic by way of how they choose to compose in a given space, the type of piece he or she is trying to compose, and how comfortable they feel in a given studio. Quality of equipment available is important, but the composer's personal preferences must not be underestimated.

The third facet of *institutional space* is much more closely related to Smalley's notion of *mechanised space*. It revolves around the idea that the city an institution is placed in will affect the resulting compositional output of that institution in some way or other. It is easy to say that a composer's surroundings will, either consciously or subconsciously, affect his compositions. In the conscious bracket comes the use of sounds directly from the city, for instance in my composition *Timpani of Rain (2011).* The subconscious element is harder to pin down, but easy to speculate on quite succinctly. For example, a composer working in a city-based institution may relish the urban life, and

incorporate mechanised sound sources into his work. Other composers may not, and their music may incorporate more synthetic sounds and sounds recorded in more rural locations; a piece containing these sounds might mean a composer is using electroacoustic composition as a form of escapism from his environment instead of embracing it. This is contradictory to the paradigmatic view that electroacoustic music better represents the surroundings that it is composed in, due to the likelihood of it including some sound recorded in the locality or objects specific to that location are recorded in that studio. This idea of compositional escapism from an environment is harnessed by the studio, an environment sometimes entirely concealed from the real world by a lack of natural light. It is not a negative thing either; a selection of composers, on a spectrum of local to international, will all have different reactions to the surroundings of the institution they work in, which provides a broad framework for the community of composers in an institution to explore this notion. This is yet another good example of the importance of an institution for acousmatic music; the compositions reflect an array of environmental reactions, in subtle or unsubtle fashions.[46] A composer's like or dislike of his living environment is likely to affect his aesthetic in some form; thus, the paradigm of electroacoustic compositions representing their composer's environment has not been broken, but merely shifted to include works that embrace and/or reject his or her environment. Embracive and escapist sound-worlds may well form a spectrum on which to conduct musical and sociological analysis; composers' works could be rated on this scale and the composers themselves interviewed, to see if their compositional methodologies match up with their levels of affection for their environment.

It is this new term of *institutional space* that solidifies the links between institutions and the aesthetics of acousmatic music. On top of my sociological reasoning for the importance of institutions in the first chapter of this thesis, this expansion with regard to *institutional space*

[46] Manchester Sonic Meta-Ontology, an electroacoustic project co-ordinated by Ricardo Climent, began to explore this idea through the creation of new compositions.

demonstrates that there are interesting aesthetic impacts for the composer and the genre as a whole. The search for an aesthetic framework is, in my eyes, not necessary, but merely interesting. I have outlined a number of ideas in this chapter about what makes a valid piece of acousmatic music; use of reverb, positive working environs, methodical use of synthesis and amount of real-world material in a piece. Composers may choose to disagree with it. However, the link I have made between aesthetics and institutions is something I view as necessary, given that it seems almost common knowledge in an abstracted way. A *Birmingham sound* was established in the 80s and 90s with the rise of BEAST. The sound of the composers working here was one of tactility and gesture with the raw sound materials concerned.[47] A *Manchester sound*, with reference to the rise in competition-winning pieces from the likes of Sam Salem, David Berezan and Manuella Blackburn, has also been considered.[48] This sound is one of details, extraction of small sounds and intimacy of material. This *Manchester Sound* is a clear reference to the style of the pieces being produced by some resident composers (and does not reflect all of the composers' compositional styles at this place), but the fact that a new *community aesthetic* has developed and been successful is surely a testament to the interlinked notion of electroacoustic communities, institutions, environments and a communally-viewed set of positive aesthetics for the construction of acousmatic music.

[47] See: Adrian Moore, *Study In Ink (1997) ;* Alistair MacDonald, *Dreel (1996);* Pete Stollery, *onset/offset (1996)*
[48] In conversation with Adrian Moore, 2011.

Chapter 4

Gesture and Image: Non-Institutional Aesthetic Paradigms

One aspect of my compositional stylistic development that has not been due to institutional change is my continued focus on gesture. I have become very interested in how extreme gestural shaping can result in the enhanced cohesiveness of an acousmatic work. It appears to be yet another aesthetic crux of the discipline. Gesture is defined in the Merriam-Webster dictionary as 'a movement usually of the body or limbs that expresses or emphasizes an idea, sentiment, or attitude'. Musical gesture in live performance retains the idea of body or limb movement, but gesture in acousmatic music dislocates the relationship between physical movement and resulting musical shape. Composers use gesture, or *impact*, as points of departure for other sonic material. This is notable in compositions such as Manuella Blackburn's *Casual Impacts* (2007)[49], Martin Curtis-Powell's *The Erinyes* (2010), Peiman Khosravi's *Convergences* (2009) and Timothy Cooper's *Kaktos* (2009). Here, I have listed four pieces from four composers who attended four different institutions, demonstrating that gesture is not an institutionally-specific aesthetic goal. It could be stated that gesture is not institutionally specific in modern-day acousmatic music because placing gesture at the forefront of the compositional spectrum was first taken up by composers at the GRM[50], an institution that has influenced many modern institutions. This is not to say all composers are interested in gesture; some may prefer to create music based around slowly-evolving textures. However, in acousmatic music, gestures allow for rapid shifting from one block of sound to another, due to the 'shock' element of the dynamic variation. This usually revolves around a curve from quiet to loud and gradually returning to quiet. Gesture is provided with even more impact in diffusion, enabling dynamic variations to be enhanced due to the vast array of speakers that one could choose. For instance, at a quiet section, one could operate two speakers, fading in to 20 for a gestural climax.

[49] Manuella Blackburn, *Casual Impacts* (2007), Musica Viva Winners 2007-2010 Publication CD, Lisbon, Portugal.
[50] Marc Battier, *What the GRM brought to music: from musique concrète to acousmatic music,* Organised Sound (2007), 12: 189-202, Cambridge University Press

Due to the often inherent lack of rhythm in acousmatic compositions (although rhythmical sections are becoming more prominent in the genre,[51] despite being viewed as aesthetically negative if rhythm is overused), gesture acts as a kind of replacement musical parameter for the genre.[52] My interest in gesture builds from a reaction to *subtlety* in contemporary music in general. Robert Normandeau's coinage of the term *cinema for the ear* is something I see as important for the genre; as much as this term is about generating the visual through the aural, I furthermore see it as relating to a surround sound diffusion 'experience', to the intense shock one can gain from the surround sound in a cinema. Gestural shaping and intense dynamic variation in acousmatic composition is the best method of achieving this exciting, cinematic notion. New music that makes interesting and original use of gesture should be given a lot of credit for its exploration of an acousmatic *parameter* for composition.

Another aesthetic paradigm that is strongly prevalent in the genre, and one that I have become more conscious of as a composer, is the *stereo image*. In the context of acousmatic music, this was discussed at length by Smalley in 'Space-Form and the Acousmatic Image'[53]. Good *stereo image* helps to articulate a natural sense of space in an acousmatic composition, and a great deal of Smalley's research has cemented the idea that space is integral to acousmatic music. In recent works, including *Vanity Procedure* and *Cyan,* I have become more interested in adding spatial information during the processing stage of composition, layering panned grains with strong stereo width on top of more static, drone based material. I have also made more extreme use of the stereo space as a result of incorporating spatial motion into the recording phase, which was undertaken with the tearing gestures in *Vanity Procedure*. The stereo space is articulated by these gestures,

[51] Peiman Khosravi's *Convergences* (2009), my works *Surge* (2010) and *Vanity Procedure* (2010), and Pierre-Alexandre Tremblay's *For Ever Now Soon An End* (2010) all make use of rhythm for an extended section of the piece.
[52] This is an area I am particularly interested in researching upon starting my PhD study.
[53] Denis Smalley, *Space-form and the Acousmatic Image,* Organised Sound (2007), 12: 1, 35-58, Cambridge University Press

making the listener more aware of the movements and potentially their concert surrounding. It was this idea to combine extreme articulation of stereo space along with gesture that has come to be a strong drive for my compositional ethos, despite neither of these notions being institution-specific aesthetics. However, more of the composers I have encountered recently during my studies at Sheffield were engaging with spatial-information-processing, which is likely to have influenced my enhanced use of it, even if members of where I studied previously had given this sort of processing similar consideration, but perhaps not at community level.

Chapter 5

Tools: Constructing the Aesthetic

My idea of a changing aesthetic resulting from a change of institution is not just down to environment and community. The cold, hard computational side must come in to play; processing tools. This is an area I am not hugely fond of discussing, but its stronghold on aesthetic development between institutions is clear, especially from my personal experience. Each institution will possess its own selection of processing tools, most likely determined by the electroacoustic staff at the given university or college. This, in itself, already creates a divide between what is available for one composer and another at two different institutions, and in essence, may well be out of their hands. This creates a resource problem prominent in instrumental music; if the desired result is a piece for orchestra and the piece contains extended techniques, some of which the players are unable to do, the piece will have to be revised. A composer expecting to use a granulation tool no longer available will have to compromise with a new tool, which may be perceived as an aesthetic development but also may be merely frustrating. I will continue to discuss this notion when discussing my own music as well.

During my Master's study, I have used a completely new set of processing tools, many of them open-source. Many of these tools had the same end goal; delay, FM synthesis, echo, chorus, etc. However, due to the different algorithms and the different modes of operation, they felt like entirely new instruments. Some tools were more effective than others. New tools were developed throughout the year. This was a fact that influenced the development of my compositions; as new tools were constructed in-house, I trialled these new processing tools in each new composition. This was an exciting process; the idea that computing and music evolve at a similar rate is best summed up when tools are tried and tested with each piece. This is in contrast with the previously discussed aesthetic

paradigm that tools should not be heard in a piece of music. As a composer, the ability to explore textures with new tools seemed like a natural development; a change of tools helps a composer hone his/her aesthetic. This is not just because a composer can expand upon the sounds they know how to create, and thus create in their head before studio processing, but also because the composer begins to understand what musical ideas they want to achieve, and use whatever is at their disposal to get to this result. Thus, both sides of the coin are polished; the artist can both experiment with new tools to coax new sounds, and also develop their personal predisposition for sounds by trying to work with new tools to achieve an 'old' result, perhaps hinting at a previous institution's sound.

5.2 The Composer-Programmer: A realistic expectation?

Building on from a discussion about tools, I must also discuss the 'composer-programmer' ideal. To be able to compose electroacoustic music, one needs to have quite a wide knowledge base; snippets of general computing, electronic music techniques, potentially some more advanced computing, compositional thinking, and also knowledge of music theory. It is not easy to become hugely proficient at both computing and composition; in the UK, computing would come under a computer science degree, and not be included in a BMus degree. This is initially a huge gap that is covered up by the general increase of computer-music proficiency by today's current generation of youth, solidified by the vast array of new digital musics being created using programmes such as Logic, ProTools and Cubase. However, this does not approach the complexity of code that some electroacoustic composers are expected to grapple with in their degree study, which are either

patch-based or code-based programmes.[54] Georgina Born, when describing composers learning the IRCAM computer equipment in the 1980s, states;

> *For unskilled users, we have seen that it was impossible to intuit the implicit logic of the codes, so that their use required guidance and lengthy application. Even then, unlike skilled programmers, naive users learned to control and interact with only the surface level of the hierarchy of codes.*[55]

She goes on to mention the 'condensed complexity and unintelligibility of the codes themselves.'[56] One might observe this statement and realise that it is referring to the electroacoustic community in the 1980s, not today. However, it still has a lot of relevance to how electroacoustics, especially in the UK, operates today. Some composers, such as Iain McCurdy and Victor Lazzarini, have made interesting and important contributions to electroacoustic tools by coding them from scratch. However, broadly speaking, acousmatic composers in the UK do not also write software that provides important and significant contributions to the electroacoustic community. This is not a negative thing; despite the successes of composers like McCurdy, it is not necessarily a good idea to expect a composer or programmer to become incredibly proficient in the other field. Some knowledge will be required in both fields, but this is not to such a degree where the 'composer-programmer' bracket can be applied. Born goes on to say of IRCAM:

> *This recalls the realistic view of tutors, mentioned earlier, that to begin to be truly at home with IRCAM technologies took several years' full-time application. (p229)*[57]

I personally have found the latter part of that statement particularly poignant during my Master's study. It must be noted that full-time Master's study is only a year long, immediately denying the student the opportunity to apply themselves to anything for several years full-time. To gain a good

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[54] Kim Cascone, *'New Music New Tools'* in *The Aesthetics of Failure: Post-Digital Tendencies in Contemporary Computer Music,* Computer Music Journal (2000), 24:4, 12-18, Cambridge: MIT Press
[55] Georgina Born, *Rationalizing Culture*, 1995, University of California Press
[56] Ibid.
[57] Ibid.

grasp of computer code, including a different operating system (Linux), programs such as CSound, and even well-interfaced front-ends for these programs, might take a significant amount of time. For the keen composer with an obvious time constraint, getting to grips with front-ends that process sound may well seem more important than learning code. As naïve as this statement sounds, it supports my introduction to this thesis; at no point did I suggest the entire electroacoustic community were all competent at all tasks. In a recent conversation with a lecturer in electroacoustic music at a UK institution during the ICMC 2011, I was informed that he felt his lack of programming knowledge did not impede his compositional ability, but nonetheless felt self-conscious about this over the course of his PhD study and especially in conference surroundings. The mathematical nature of the computational side of the discipline can seem intimidating to those with little knowledge of it, whereas a lack of compositional experience does not seem intimidating to those who write software. This may be because composers are at the top of the electroacoustic 'food chain'; composers need software developers to help advance their tools and thus achieve their artistic goals, whereas software developers do not *really* need composers to write software. Composers merely aid them in the construction of a tool that will be useful to generate artistically satisfying results.

It is important for an institution to possess students who are proficient in a variety of areas, but as stated above, there is not a need for a student to excel at all aspects of the genre. In the long-run, after some years in the field, it might be realistic to expect a composer to have learnt some coding language, and for a programmer to have gained practical experience of composing in the genre. However, early on in one's compositional or computer-music programming career, this is seldom if ever a realistic option. This is not to say that there is no effort in the UK to try and blur this mutual exclusivity, and to get students to engage in both programming and composing despite the fact that composing is clearly the primary desired outcome (as, for a student, the composition is likely to be a

piece of assessed work). For instance, Adrian Moore and Dave Moore, in their 2007 paper, state, when discussing the use of Linux for creative music technology education:

> *It can become too easy to work on secondary solutions (such as developing a set of infinitely expandable and adaptable tools) and forget that (in this instance) an electroacoustic music composition was the primary goal.*[58]

It is this primary goal that I feel is still not being acknowledged by some computer music programmers, who develop software that is interesting computationally and nothing more. I must note how many composers I have met who have learnt some programming, and how few programmers have composed: during the ICMC 2011, it became obvious through the conference paper sessions that a reasonable quantity of them were presented by programmers who had not composed any music with their tools, and a minority had worked with composers on their project.[59]

I am heavily critical of some people's non-musical approach to musical software development in a discipline that should be, first and foremost, about music. However, it must be acknowledged that the development of tools for processing, spatial audio and other functional tools, is done professionally by technologists who have dedicated a lot of their time to these projects, and thus it is completely forgivable that they have not composed, especially those in early-career stages. It is, however, important that the line between composing and programming is, over time, continually blurred, as it has been for the past 20 years since IRCAM. Many more composers are now capable of constructing patches in PureData or Max/MSP by themselves in order to realize compositions for instrument and live electronics, but it would also be positive to see more programmers writing some music with their tools, no matter how rudimentary, to demonstrate they better understand their

[58] Adrian Moore and Dave Moore, *Adapting to change: working with digital sound using open source software in a teaching and learning envrionment,* Journal of Music, Technology and Education*,* 2008, Vol 1.2/3, 113-120

[59] Javier Ramos and Rodrigo F. Cadiz's 2011 paper *Sound synthesis model based on the simulation of a gaussian bouncing wave packet* was a great example of a paper that had resulted in no musical use.

work as a musical tool). Even composers in earlier GRM eras, similarly to IRCAM composers, were likely to have no knowledge of computing due to well-interfaced tools, whereas now many composers there would have experience with MAX/MSP at the very least. It is also important that composers are able to articulate themselves about what they want to create in their electroacoustic compositions, in order to assist in the creation of new programs if they cannot create these themselves.

Chapter 6

Electroacoustic Works Illustrating the Idea of an Influential Institutional Aesthetic.

6.1 Vanity Procedure: An Intermediary Phase of Two Aesthetics

Vanity Procedure was composed in three weeks during October 2010. It was written particularly quickly in part due to the long period in which I had been unable to compose any acousmatic music due to being outside an academic institution with its studio facilities and not possessing the equipment at home to do so. The previous piece I had completed, Surge, was finished in May 2010, so this piece ended a five-month hiatus from composing. The first four weeks of my postgraduate study was spent not composing, but frustratingly getting to grips with an entire batch of new software, including Nuendo, Blue and Csound. On top of this, I was also getting used to the dual-boot possibilities of Linux and Windows; previously, I had only composed in a Macintosh environment. With many creative ideas already building up, having software get in the way of them was something I found hugely detrimental. However, in retrospect, those four weeks have become incredibly useful ones, as I broke my habit of working and created a second method. In a recent conversation with Simon Emmerson, he was quite happy to admit he composed in ProTools out of habit; it is what he always had done. Even after I had got to grips with these new tools, I was still learning 'on the job' as I was composing Vanity Procedure, making the compositional process twice as experimental as it had been previously.

The impetus for this piece came from a collaborative recording session with two of my colleagues. This was a new venture; I had not previously done a collaborative recording, but merely recorded in the studio on my own, using other people as sound agents but not treating the recording session as a shared creative entity. This is another part of creating electroacoustic music which can carry an

important community aspect. This collaborative recording was such a success that it was subsequently done again for *Cyan*, and is something that happens relatively frequently in the Sound Studios in general. This pre-compositional process of recording often makes a huge impact on the piece produced subsequently, and has certainly been the case for all my works produced in the Sound Studios in Sheffield. The high quality Neumann microphones and dry space in the studios allowed for high-clarity recordings of the *crotales,* a unique pitched source sound in *Vanity Procedure*. For my purposes, recording them involved striking the discs and letting them decay naturally (they possess a very expansive natural decay) and striking three-voice chords, also allowing these to decay naturally. I had not, prior to the recording session, planned to use the crotales in a composition at all, but the community involvement in this recording session changed my viewpoint on this. I actively formed my own ideas on the spot as to how I might use the crotales as a sound source in an acousmatic composition. I also chose to record the tearing of corrugated card, the jangling of metallic objects including keys, a brass guitar slide, and also the sound of coins moving inside a metallic ramekin. The corrugated card was chosen for its gritty, dry quality when being torn, which complements the glossier sounds created by the guitar slides and the ramekin. The ramekin was used to add resonance to the coin jangling; a natural pitch-accumulator tool. The coins were used to reflect the 'consumer' theme with regard to *Vanity*. The corrugated card was also chosen for an extra-musical reason, to reflect the amount of paper and card-based waste is produced by the packaging of cosmetic items.

It is this idea of strong sonic dichotomies that defines the aesthetic of the piece. The use of pitched and non-pitched material, processed and unprocessed material, gestural and drone-based material highlights this idea. All of these dichotomies are easy to hear within the first minute of the piece, and are highlighted by my graphic score (see appendix 1). For example, at 00:15, an easily detectable cardboard tear provides a gestural close to a longer extract of abstract granular material. At 00:37, a

strong non-pitched gesture gives way to a chordal, tonal drone. I am certain that all of these notions were enhanced by the fact that it was the first piece I was composing in new studios with new software, whilst trying to emulate previous studio experience and two different acousmatic bases. My forming ideas about using gesture to create structure related easily to the composition of this piece – gestures would be the point of departure for all other sound material. Not only that, but most, if not all sonic material, could be used in a gestural fashion. The use of the 'tearing' gestures is somewhat easy to detect early on, but in both gestures at 0:04 (crotale mixed with tear) and 8:18 (crotale alone), pitched sources were used as impact-based gestures. At 04:28, the crotale acts both as a gesture and as the beginning of a short descending melodic line. It is the initial tearing gesture that recurs most frequently, becoming gradually more abstracted throughout the piece via filtering processes. This gesture acts as 'something to hold on to' for the listener, a recurring structural device to create coherency. Creating structure can be difficult when the process by which acousmatic music is created is so organic, hence my decision to consciously approach structure with gesture, which I now view as a musical parameter.

These dichotomies contribute to this piece's overall coherency as they are highlighted for musical effect, but they also highlight the institutional change. Many sounds were left in a raw, source-bonded state, in which subtle equalisation was used to aid blending and to slightly blur the rawness of the recording. Small sections, mainly the drone based ones, were heavily processed and bore no resemblance to the source material. These small sections of heavily abstracted material did not feature in my music during my previous studies. *Vanity* Procedure's opening minute reflects this: only processed abstract sound and unprocessed (but subtly equalised) sounds occur, with no processed source-bonded sounds to occupy a middle ground. This demonstrates my two extremes of working, which in my view are two institutional *sounds* that I am attempting to blend. What is also notable from the graphic score is that textures are often a mix of drone and granular at the same

time; textural mixing has been successful, even if sonic material seems to have a disconnected feel between it. Having been surrounded by colleagues working with more abstracted sound, I began to experiment with this idea in *Vanity Procedure*, but not to a degree that these sections dominate the piece, as they are frequently interspersed with source-bonded sounds or sections.

6.2 Grayscale Confessions: Impact-based Piano Concerto?

Grayscale Confessions was begun with the motivation of writing a piece using a modern, full-frequency instrument. In *Vanity Procedure*, I had only used the crotales, which occupy a very narrow band at the high end of the frequency spectrum. I was also keen to use the piano because I had not written any music for it prior to this piece. My preconceptions of the instrument have always been somewhat negative due to my inability to play the instrument. Before attending university, I was asked to have grade-5 standard piano; not only do I still not have this, I have never had a piano lesson. It was during my undergraduate degree that I began improvising at the instrument, and using it as an open sound source. For *Grayscale Confessions*, I played all of the piano recordings, which were entirely improvised. This pre-compositional improvisation is then followed through with the improvisatory nature of composing in the studio.

The piece, in terms of materials, processing and overall feel, is a ‘slow’ piece. The first section’s opening piano strikes take a long time to decay, making the introduction to the piece very stately and foreboding. This is enhanced by the use of reverb on these key strikes: a larger space is implied, adding to the sense of grandeur that is often brought about by a stately introduction. This contrasts entirely with *Vanity Procedure*, which is a very fast-paced piece with a great deal of intense spatial motion. I composed the piece with thoughts of slow music in mind and with regards to composing

the antithesis of a regular piano concerto, which often begins with a sprightly Allegro containing a cadenza in which the pianist is able to demonstrate their virtuosic capabilities. Seeing as I was writing for my own somewhat limited capabilities, any virtuosity would be explored in the digital domain. This 'digital virtuosity' is outlined from 05:21-06:00; the granulated stabs of piano chords create jolty rhythms which would be difficult to perform, let alone notate. Another key source sound used in this piece was the double bass, which I also played and recorded. By its nature, the instrument does not speak quickly, and lends itself well to playing long, sustained notes that are dark in colour. I processed these recorded notes with band-pass filtering, granulation and chorus, rendering the drones more abstract in nature. The double bass sounds effectively act as the 'orchestral' support for the piano recordings, which are often left much less processed, furthering the quasi-concerto feel.

The middle section of the piece, beginning around 05:24, revolves around a cycle of chords that were played on the piano, then granulated and heavily chorused and filtered. The inspiration for this section of the music was directly drawn from Dhomont's *Forêt Profonde (1996)*.[60] I admire the use of chordal textures, tonality and large-scale structure in this work. So much so, that I subconsciously have included a piano part in the same key as Dhomont's piece: A minor. Some gestural activity takes place in this section, indicating a change of key or the addition of new non-pitched layers of material. The processing applied in this section was done to smooth out the edges of the chordal stabs in the original piano recordings. At 8:33, this smoothing is applied to an even more subtle degree, with the double bass recordings clearly providing the underpinning harmony. At 9:21, the initial piano gesture is reintroduced, but only once, and is then subsumed by very abstract gestures, once again which might seem very at home in the aforementioned Dhomont composition.

[60] Francis Dhomont, *Foret Profonde,* CD audio, 1996, Empreintes Digitales; Montreal, Canada

The final section of this piece, beginning at 10:51, starts with a very stagnant selection of piano key stabs, but bandpassed heavily towards higher frequencies. This makes the piano sounds feel limp, lifeless and certainly not threatening, very much the polar opposite of the first section of the piece. It is this limpness that hints at the unnecessary nature of the piano in the final section; indeed, the instrument is pushed to the background, while the double bass and quasi-environmental sounds take the foreground. It is this arrangement which pushes the 'concerto antithesis' idea to its furthest, in that the final movement does not even make a feature of the sound source that was supposedly the *soloist* in the first two sections. In addition, the double bass, normally not an instrument to be made a feature of, is brought to attention with its melodic capability. It is the three-movement form that I wanted to make a feature of, teasing out questions concerning the concerto.

What is notable from this piece is that it does not make any significant step forward from *Vanity Procedure,* and compared to *Cyan* and *Reflux*, it could be seen as a step backward. A vast quantity of unprocessed piano material is apparent from the opening and right throughout the piece. A few unprocessed tearing sounds feel out of place, as they have not been made a feature of. Due to their interest, I feel they undermine the surrounding material at 02:56, and think they are far more effective in the previous piece. In the later stages of the piece, the double bass sounds are also almost entirely unprocessed. The granular material then strikes the listener as the processed part, whereas the accompanying melodic interest is raw. This prevents a particularly cohesive sound-world from being created, except at points where the melodic interest also is abstracted, for instance at 02:24. The piece suffers from a lack of sonic cohesion and an excessive use of similar granular material, and an over-focus on the 'respect' for the source material. It is this perceived weakness from a compositional viewpoint that pushed me in the direction of synthetic sound in the long run. The piece highlights my struggle with perceived institutional aesthetics due to its great

distance between a clear, unprocessed sonic signature in the piano sounds and the heavily processed surrounding material, but does not capitalise on them in the way that *Vanity Procedure*'s 'collision of worlds' style does.

6.3 UltraViolet: An entity of abstracted sound

At no point in any of my previous compositions had I considered writing an electroacoustic piece in which none of the sound sources were revealed. The idea for this piece was lifted from an installation piece I did in November 2010, *Primary Colours*, for Bank Street Arts, Sheffield. In *Primary Colours,* the piece used piano sounds, and was a textural piece rather than a gestural one. In *UltraViolet*, I enlarged upon this idea by making a drone-based textural piece but containing a few gestures at the beginning to 'lead off' from previous compositions. One source sound, that of jangling keys, was first granulated and then put through a patch I constructed containing 10 separate comb filters and two delays. This enabled me to make thick chordal textures out of what was essentially non-pitched material. The chords were chosen in an organic manner, in that I did not decide beforehand which chords I planned on constructing. However, the chords do, for the most part, relate to each other in a tonal fashion. The opening 30 seconds of the piece is an authentication stamp of the time in which I composed it: the gestures reveal a composer who is not yet comfortable with entirely ambient, textural music. The piece also contrasts with others in my output in the fact it is only 6 minutes long. It attempts to sidestep the structural issues concerned with writing a 16-minute piece that were presented with *Grayscale Confessions*.

Drone-based music and abstracted sound material go hand-in-hand, in that aside from bowed strings and engine noise, it is very difficult to find sounds that can possess an almost infinite duration. The ability to create infinite durations using processing tools means that drone sounds will often not possess the characteristics of their source. Time-streching tools are particularly guilty of

this, but in the case of *UltraViolet*, it is more so that the tools I used (comb filters) layered so much colour over the original sound that the original's jangling qualities are difficult to detect. The shimmering tonal inflections over the drones may represent some of the original jangling, but it would not be obvious without being informed of the original recording's qualities.

My decision to write a piece that revealed no source sounds was a reaction to some treatises on electroacoustic music (Landy, Understanding the Art of Sound Organization; Wishart, On Sonic Art); we are informed that revealing source sounds is a key method of interacting with listeners on a personal level. I do not think there is a need to connect with the listener in electroacoustic music in order for the listener to enjoy the piece. *UltraViolet's* overall ambience is somewhat romantic: the chords used are thick, lush and dense, and the progressions could be described as self-indulgent. The piece highlights absorption of synthetic ideas, without using synthetic sound. It is a huge step forward in terms of musical thinking from *Grayscale Confessions,* but did not reflect the long-term vision of where I saw my compositions going. It is a reaction to previous works in an extreme sense, and despite not being a piece with a huge amount of content variation, it is an effective work and was a good step towards future compositions. l began thinking about how to render abstract sound, whilst still at that point not using synthetic material.

6.4 Cyan: A honing of gestural style

At the beginning of February 2011, I began to work on a new piece as a result of another collaborative recording session, in which the vibraphone and marimba were the primary sound sources concerned. It is apparent that these two instruments differ wildly in sonic quality, even if not obviously: the vibraphone, with its metallic sound, is enhanced hugely by the sustain pedal, allowing

the performer to generate dense clustered chords that have prominent beating in the decaying sound, whereas the marimba has very little natural sustain aside from its very lowest notes. The studio is a particularly useful tool for the enhancement of marimba sustain. Recordings were done with two performers playing a mixture of 8-voice chords, improvised cross rhythms and some stick-rolls. Nearly all sound material in the piece was generated from the recordings of these two instruments. The very gestural nature of these two percussive instruments allowed for a variety of impact based approaches to gestural material development and lent the piece a point-of-departure style of structuring. However, it was in the studio, using granular tools developed by colleagues that the strong tension-release gestures were generated, thus adding computer-based gestural creation to the recording-based gestural sound acquisition. The intense gestural nature of the piece is visible from the opening (see graphic score, appendix 2). The aforementioned granular tools were first used on this piece: prior to this, a pure-data granular built by colleagues and a CSound granular built by Iain McCurdy were the primary tools of choice. I was able to generate these gestures by slowly shifting the 'position' whilst maintaining the rate of soundfile playback at a very low level. Marimba samples were also placed through this tool in order to generate longer samples of material.

The construction of *Cyan* was somewhat orchestral: layers of high, low, fast and slow material were organised with the orchestral approach of *Grayscale Confessions* in mind. Also, pitch had come to the forefront in a different fashion. As opposed to *UltraViolet*, in which I organised the chords through comb filtering, *Cyan's* chords were chosen at random from a wide selection of samples and not altered. It is a coincidence that clear tonal spaces (especially in the middle section: a minor IV – I progressions arises at 02:54 and at 03:25). Chord progressions, like three-movement forms, might be seen as outdated and not avant-garde by many composers, but they do also provide something to hold on to in the composition for people who may be fans of popular music but are unfamiliar with the electroacoustic realm. It is the spatial aspect of the piece combined with the recorded sound

that helps solidify the work as one artistic entity. All the recorded marimba and vibraphone sounds were recorded successfully in a dry space, where the room was not heard in too prominent a fashion. The strength of the recordings helped build the aesthetic strength of this piece.

The mix of synthetic material and real-world processed sounds also highlights the aesthetic that I have developed in my music throughout the course of this period of study, incorporation of my aesthetic leanings from my University of Manchester study and compositional practice. Many of the swirling, bike-chain like sounds that speed up and slow down are highly synthetic, but due to use of specific algorithms and filtering techniques, the sounds retain a crunch and a texture which makes them feel more real. Some of these sounds were made from real-world sounds through 'freeze-framed' material inside a granular tool. Thus, the distinction between the real and synthetic is blurred to help create a sound-world in which the listener is unsure, and potentially uncomfortable, over what is real and what is unreal.

6.5 Reflux: Incorporation of Synthetic Sound

Just before the composition of *Reflux* began, I underwent an experimental period of trying out synthetic sound generation tools. I had not previously used these CSound-based tools, which mainly consisted of the *wavelets*, *fof* and *stochastic* algorithms[61] and patches developed in Blue[62]. It was during this period that I began to see how synthesis would fit into my compositional vision. More and more, I noticed my music was focusing on chordal blocks of sound, and material that focused on motion. Once I had established this fact, which had become obvious from the composition of *Cyan,* I began attempting to replicate the sounds I had once constructed by abstracting real sounds by using

[61] Developed by Iain McCurdy.
[62] Written by Adrian Moore.

synthetic algorithms. The entirety of the opening of *Reflux* was constructed with Iain McCurdy's *wavelets* tool.[63] It was this initial piece of sound material that spurred the piece on, and the piece grew organically from the beginning. The piece is a huge compositional development because the synthetic material manages not to sound 'cold', as it so often can, which was my initial concern over synthetic sound, and one I discussed earlier in this thesis. The strongest example of this is at 01:45 and at 06:47, in which melodic, bell-like chiming tones sound very 'real' in an unrealistic fashion. This 'coldness' was something I avoided by comb filtering, chordal overlapping and use of chorus to fatten out the sounds of the synthetic drones. Another example is at 05:54 in the piece, in which an expansive chord sounds very organ-like, but is of course processed synthetic sound material that has had colour added to it by some of the processes I have just described. The introduction sounds somewhat engine-like, as if something mechanical had been compressed very heavily, and possesses a strong kinetic energy. The dynamic variation from the opening statement to the first big gesture creates a sense of excitement in the piece. This first gesture and the one that follows at 01:26, are part of my new aesthetic that I have developed during my recent studies, in which the use of synthetic material, chordal colour and gesture work symbiotically together.

Interestingly, as well as including entirely synthetic sections, I also chose to include very raw, unprocessed sections of material, but the amount of this material is not enough to detract from the overall synthetic ambience of the piece. This can be heard very clearly in the first minute and a half of music, absolutely all the material used is synthetic. At about 02:00, a section of crumpled wrapping sounds, entirely unprocessed with the exception of some volume boosting, enters the piece. In a sense, this piece attempts to smooth over the cross-instituional aesthetic outlined in *Vanity Procedure.* In the former piece, abstracted sounds and real sounds collided in a rather unsubtle fashion. In the latter piece, attention is paid to transition: from 05:36 to 05:50, the

[63] Iain McCurdy, *wavelets synthesis algorithm,* accessed August 2011 at http://iainmccurdy.org/csound.html

transformation from a synthetic glissando to crumpled unprocessed material can be heard, in which the sounds are blended together well texturally and registrally for a seamless material shift. This exemplifies my development as a composer, creating smooth and interesting transitions from the real to the non-real. Interesting transitions between real and non-real material are viewed as a strongly positive aesthetic aspect in acousmatic composition; this technique is exemplified in Andy Lewis' *Scherzo* (01:42, transition from child's voice to abstract drone).[64]

Despite the focus on synthesis, the piece also plays on the use of gesture, which is how the title came about; *Reflux* motions often refer to acid coming back up a person's throat, in the same way that sounds descend and then new material is thrown violently up by a strong gesture in this piece. The processed Irish Jig near the end of the piece at 07:58 is a fine example of this, and to contrast with the synthetic sounds of the start, this section contains only real sounds that are well source bonded. They are hinted at in the section just before with the second instance of the synthetic bell-tones, during which snippets of the jig section are quietly incorporated, also observing the tonal centre of the bell material. It is this effective, efficient section of mixed synthetic and real-sound that further embodies my compositional development.

6.6 Return To Sender/Shortfall

Return to Sender was composed during June-July 2011. During July 2011, the piece was cut in half, and the first half formed an offshoot piece named *Shortfall*, which contained an ending not found in the initial work. The piece was inspired by the idea of exposing inner and non-existent resonances, based on the source sounds that were recorded for the piece. The inner resonance idea stemmed

[64] Andrew Lewis, *Scherzo* (1992-1993), Available on LEGACIES: Works from BEAST, vol. II; Sargasso SCD 28046, 2002.

from a close recording of a ride cymbal. A great deal of the inharmonic resonance from the cymbal was captured by moderate-force strikes followed by letting the sound decay naturally, sometimes between 30 seconds and 1 minute. The non-existent resonances came from the recording of a classical guitar, which naturally results in a very rapidly decaying sound. Thus, I had one set of recordings with lengthy natural decay, and another set in which I would set out to add resonance with computer processing. This piece attempts to incorporate a 'live-electronic' aesthetic of extending the capabilities of an instrument, most notably the guitar in this instance. The cymbal was used to create a slow, brooding opening section to contrast with the rapid, aggressive openings of *Cyan, Reflux,* and *Vanity Procedure*. As a result of the use of these sound-sources, the gestures involved are far more subtle.

What occurred during the process of composing the opening of *Return To Sender* was that the cymbal recordings were placed quite far apart, unprocessed and on their own, eventually building in to combining them with other materials (00:00-03:00). At this point in my compositional thought, I acknowledged that the opening sounded too desolate. Once again, synthesis was turned to; I generated pitch-based material using another algorithm, with a pitch register in mind that would both complement but feel separate from the cymbal recordings. High-frequency material was chosen and subsequently interwoven into the piece. During my earlier studies, I would have been very unlikely to have engaged in this compositional decision. After this, the cymbal recordings themselves were all subtly filtered in different fashions to colour them. This helped the piece develop an identity away from the recordings, which as I discussed earlier, is an aesthetic issue that must be considered.

The guitar-material was left entirely unprocessed in register, with the exception of 02:16, in which the interrupted cadence progression, having been pitch-shifted up roughly an octave and a half, is used to inject pitch-based material into the cymbal-section, which is more timbre-focused. More subtle processing was used during the guitar section such as very slow-rate soundfile playback, thus bringing out resonances in the guitar sounds that often go unheard. Processing of this nature is hugely prominent between 04:11 and 06:50. This once again supports the *sonic microscope* idea, in a less literal and more process-oriented sense than simply placing a microphone very near the sound source. The idea of resonance appears more strongly during my previous studies than at present, for instance in my 2010 piece *Surge*, in which I explored the resonances of Viola da Gamba chords. I think this marks a difference between the institutional aesthetics I have discovered. Indeed, current colleagues have not been forthcoming in reflecting upon the idea of a *sonic signature*, which for me, refers to the idea that a piece thoroughly explores one or two specific sound sources. This often means exploring the inner resonances of the chosen sounds.

The second half of *Return To Sender* (06:55 onwards) contains small sections of material present in the first half of the piece, for instance at 08:55, when the guitar material returns in a slightly more coloured guise, some of the sounds having been phase-reversed. However, for the most part, it is entirely new, and entirely synthetic, with long, lush chords evolving and devolving within themselves. Very low levels of gesture are used, reflecting some of the drone-based practice I established with the composition of *Ultraviolet.* At 11:32, one can hear some of the cymbal scraping material established very early on in the piece, at about 00:55. The synthetic, drone-based second half bore so little resemblance to the first half that I opted to create the second version of the piece, named *Shortfall*, to establish it (the first half) as a separate entity. The two entities of the piece were almost like colliding aesthetic values from the institutions at which I have studied. *Shortfall,* follows on from *Vanity Procedure* with its real-world sound focus, but is more of an aesthetic blend having

incorporated synthetic sound (the initial, high pitched material at 00:30). The entirety, *Return To Sender*, fails to grasp an individual identity. This is, in essence, a success within a compositional failure: the shorter piece demonstrates institutional aesthetics that have successfully merged, whereas the longer piece demonstrates a huge disconnect between the real and the non-real, which in the simplest terms, represents two institutions.

Conclusion

It is ironic, in a sense, that prior to the conclusion, a composition was discussed (*Return To Sender)* that, in a way, failed to exemplify the part of the title I dubbed 'Towards Abstraction', and that furthermore, the resulting successful piece, *Shortfall*, had moved far away from the strongly abstracted direction I had been working towards with *Reflux.* However, it would seem quite clear that throughout the course of this year's study, my compositional style has moved further towards abstracted ideas. This is, in part, due to my underlying interest in gesture in acousmatic music. Gesture is effectively indiscriminate between the concrete and the abstract; it is about shaping, and as a result of my interest in this, sound material has been allowed to evolve along with the gestural shaping at the forefront.

However, the increased abstraction in my music is not merely a by-product of my interest in shape; it reflects strongly on my interaction and integration into a new electroacoustic community, which is a difficult task to do in one year. As I discussed nearer the start of this thesis, communities in institutions are hugely important in the development of electroacoustic music, as they allow for an exchange of musical as well as computational ideas. A studio community means that composers can easily hear other composers' works in progress, and understand the evolution of a piece, whether it be theirs or someone else's, at a more fundamental level. The community also allows for an exchanging of hints and tips on how to extract sounds from new and different processing tools. Not only is it useful musically, but there is a social aspect to it: day-to-day interaction in studios prevents the extended periods of isolation that is an occurrence for at-home, non-community composers. The interaction provides non-musical, social stimulation as well as out-of-studio but still music-oriented discussion which, from personal experience, helps increase focus during a studio session.

This community, in a new institution that I moved to for Master's study, carried an aesthetic that I eventually absorbed, culminating in the composition of *Reflux*, a piece constructed almost entirely with synthetic and abstracted sound material. I worked toward this piece having previously been more interested in *musique concrète* approaches to acousmatic composition, focusing on real-world sounds. Having acknowledged that I could not have produced this piece previously, not due to computational facility but due to aesthetic mind-set, it is a credit to the entire notion of institutional change and aesthetic absorption that new, original music can be created that does not sound, to such a degree, like it belongs to one *school* of composition.

It also must be noted that when I speak of an institutional aesthetic, I do not refer to it as a negative idea, but more of a positive inevitability. For example, in the UK, the acousmatic music scene owes a lot to the electroacoustic community that developed at the University of Birmingham in the 1990s and early 2000s. A group of composers, including Alistair MacDonald (Royal Scottish Academy of Music and Drama), Andrew Lewis (Bangor University), David Berezan (University of Manchester), Elainie Lillios (Bowling Green State University), Monty Adkins (University of Huddersfield), Natasha Barrett (NOTAM), Peter Batchelor (De Montfort University), Pete Stollery (University of Aberdeen), and Robert Dow (University of Edinburgh) among others, all went to the University of Birmingham to study with Jonty Harrison, and many of the above listed were founding members of BEAST (Birmingham Electroacoustic Sound Theatre). Although the composers listed may have all shared fundamental aesthetic commonalities with their interests in acousmatic music and sound diffusion, all of them have very distinctive compositional voices. An institutional aesthetic, therefore, does not result in a *homogenous* set of composers but does contribute to each of their sounds in more subtle ways. The success of founding members of BEAST hints at the possibility that the institution, and community attached to it, as well as the facilities, assisted their success. Further ethnographic research into the compositional community at BEAST during the 1990s would be interesting and very

feasible given the ease of contacting many of the current members.[65] It would also be valid research as it would better contextualise my own research into electroacoustic communities: despite my references to IRCAM, and the importance of Georgina Born's research, IRCAM is by no means an acousmatic centre, and has always focused on the mixing of instruments and live-electronics (the GRM being the optimal centre for acousmatic reference). The BEAST community in the 1990s was the first hugely successful acousmatic compositional community in the UK. Despite this partially being due to the availability of equipment, the mere availability of studios and diffusion systems still does not explain the success of such a large number of composers in the acousmatic field. A greater body of texts needs to exist regarding the acousmatic communities and institutions that house them in the UK. More ethnographic work could include profiling of current electroacoustic activity in universities in the UK and abroad. Interviewing composers and/or music technologists about their experiences within their university, national and international communities would be interesting.

Building on from this positive experience with national electroacoustic institutional communities, I must finally compliment and criticise the international community. Recently, I attended the 2011 International Computer Music Conference, held in Huddersfield, UK, which I briefly discussed earlier in my 'composer-programmer' section of this work and a few key papers from it have been referenced throughout. I must comment on how many friendly international composers, music technologists and electroacoustic musicologists I encountered at this conference, and also must compliment the standard of music at the conference. Many high-standard concerts were put on, which housed acousmatic pieces of exceptional quality, as well as audiovisual and multimedia works of the same nature. Considering a number of anecdotal criticisms of the ICMC being technology-

[65] Current BEAST ethnography has occurred almost by default, with the in-house production of a short film about BEAST. It can be accessed at http://www.birmingham.ac.uk/facilities/BEAST/about/index.aspx (as of 17 August 2011). The importance of filmed sources to produce ethnographic work was highlighted recently in Bruno Bossis' 2011 paper, *History of electroacoustic music through filmed sources: an example at IRCAM,* ICMC 2011 Conference Proceedings.

heavy, these events were a pleasant surprise. However, it is also worth noting that only one conference paper out of the large quantity that were presented made reference to the aesthetics of acousmatic music[66], one about the history of acousmatic music[67], and one other paper made a feature of acousmatic compositional methods in some form[68]. My personal goal with this thesis was to enhance the amount of literature specifically aimed at acousmatic ethnography and aesthetics. It is essential that there is more musicological writing on the genre, given that the acousmatic entries for the ICMC conference (i.e. the number of submissions prior to jury selection) numbered just under 800. With the amount of music in this specific genre being produced, more material is needed to support how, why, where and who is creating it.

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[67] Patrick Valiquet, *The Spatialisation of Stereophony: Taking Positions in Post-War Electroacoustic Music,* ICMC Conference Proceedings, accessed 7 August 2011 at http://icmc2011.org.uk/attend/papers/

[68] Robert Ratcliffe, *New forms of hybrid musical discourse: an exploration of stylistic and procedural cross-fertilisation between contemporary art music and electronic dance music,* ICMC Conference Proceedings 2011, accessed 7 August 2011 at http://icmc2011.org.uk/attend/papers/

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Accompanying CD Track Listing

1. Vanity Procedure (2010)
2. Grayscale Confessions (2010
3. Ultraviolet (2010)
4. Cyan (2011)
5. Reflux (2011)
6. Return to Sender (2011)