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# Environment in Electroacoustic Music Composition

**By:**

Vanessa Sorce-Lévesque

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School of Music, Department of Composition

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## Table of Contents

## Portfolio of Musical Works

**Found on Memory Stick**

All works are in wav format at 24bit 48kHz resolution. They are all stereo except for *An Almost Abstract Experience*, which is 5.1 on an interleaved file.

| | | |
|---|---|---|
| 1. | *Éclats de Feux* (2016) | 10'07 |
| 2. | *Omega 3* (2016) | 16'44 |
| 3. | *An Almost Abstract Experience* (2017) | 11'11 |
| 4. | *Exercitium Arithmeticæ Occultum Nescientis Se Numerare Animi* (2018) | 12' |
| 5. | *Border Crossing* (2018) | 10'10 |
| 6. | *Résistance*[1] (2018) | 10' |
| 7. | *Avalanche* (2018) | 23' |

*Exercitium Arithmeticæ Occultum Nescientis Se Numerare Animi* and *Avalanche* have scores for optional instrumentalists and are presented in their own folder. *Exercitium Arithmeticæ Occultum Nescientis Se Numerare Animi* also presents screenshots of the project for visual aid, to which there is a reference in the text.

[1] One may refer to https://youtu.be/9F7tEnN6Qnk for an example of a performance of *Avalanche* by Colin Frank; although it is not a completely definite and accurate representation of the piece, it provides one example of how the instrumentalist may go about performing the piece.

## Abstract

This PhD is centered around a discussion on some of the different notions of environment in electroacoustic music, supported by a portfolio of original compositions.

Seven original electroacoustic compositions are proposed in this portfolio. These are *Éclats de Feux*, *Omega 3*, *An Almost Abstract Experience*, *Exercitium Arithmeticæ Occultum Nescientis Se Numerare Animi*, *Border Crossing*, *Résistance*, and *Avalanche*. Each work presents a particular approach and context to the music which affect the ways in which environment is manifested within and around the composition. All pieces are stereo, except for An Almost Abstract Experience, which is in 5.1. Two of them, Exercitium Arithmeticæ Occultum Nescientis Se Numerare Animi and Avalanche include an optional instrumentalist component.

A central, overarching notion, present throughout this portfolio, is that of physical and cultural environment. These distinct types of environment are explored at length, through the lens of this varied musical portfolio, covering fixed medium, stereo, multi-channel, live-derived and game-related. This diversity in formats informs my evolving understanding of environment in electroacoustic music, and suggests different performance setups, which are explored as a conclusion of this research.

## Introduction

The central part of this doctoral thesis is a portfolio of original acousmatic compositions. These works, included in the accompanying memory stick, are in various formats, including stereo and multichannel, but they are all intended for listening over loudspeakers, and performance through diffusion. This accompanying written document introduces the various pieces within the portfolio, drawing attention to: 1) the source materials used within their creation, 2) the various ways in which those materials were developed during the act of composition, 3) the approach to structure and form. At the same time, the discussion draws attention to a central theme that runs throughout the works included in the portfolio; each piece presents materials and/or forms relating to the environment. Taken as a whole, these various approaches to the environment constitute a broad working method that typified the author's own compositional voice. Although primarily evident from the compositions themselves, this accompanying document highlights some of the many ways in which the term environment has been considered and understood throughout the creation of new works.

The various chapters relate to the various pieces within the portfolio. Thus:

**Chapter 1** focuses upon *Éclats de Feux*. It starts by introducing the notions of physical and cultural environment within electroacoustic music. Along the way, certain key terms relating to environment are introduced, along with a range of sources that have previously explored the idea of environment within the field of electroacoustic music and that discuss surrounding ideas, such as soundscape and cultural studies. It concludes with an exploration of the interaction between environment and æsthetic musical choices, and how these overlap and interact.

**Chapter 2** discusses *Omega 3*, which has a site-specific component. Therefore, we consider how environment manifests itself in this context. This chapter considers the interaction between physical and cultural environments, and examines the challenges of revisiting a piece which was first designed for a live performance environment. It concludes with an exploration of the impacts of its site-specificity on the musical contents.

**Chapter 3** addresses *An Almost Abstract Experience*, a 5.1 surround composition. This chapter examines the unique specificities of the 5.1 format, and how it is treated differently as a component of physical environment, and how it affects the musical content. It discusses the use of almost exclusively instrumental material, and how this produces a different sense of environment within the composition altogether, and concludes on a discussion on the greater form of the piece.

**Chapter 4** considers *Exercitium arithmeticæ occultum nescientis se numerare animi*, which includes multiple live performers. Here, we consider the presence of anecdote and theatricality within the musical environment of a mixed music piece, which can be performed with or without instrumentalists. It discusses scoring techniques and, ultimately, how varying performance contexts affect its environment and how the presence of instrumentalists may affect the musical content.

**Chapter 5** focuses upon *Border Crossing*, which was composed in the very unique setting of Live-Action Role-Playing (LARP) and therefore explores several layers of environment within

composition and especially during performance. It discusses the interaction between music and space and how physical environment impacts the perception of music. It also considers different layers of cultural environment, and examines both its internal and external space.

**Chapter 6**, which focuses on *Résistance*, explores themes of documentation and æsthetisation of materials. It uses cultural environment to aliment poiesis and echoes different cultural layers of society through the presence of cultural and historical artefacts and how they relate to environment in electroacoustic music. It shall explore the relationship with personal and cultural content, and how the cultural environment informs the product. Finally, it shall examine the materiality of the original sound sources as a comment on its cultural environment.

**Chapter 7** addresses *Avalanche*, which explores the overabundance of information and intricate meshes of environments, as well as how they interact together. Within the scope of one mixed media piece, there are reflections on different themes relating to excess of information and the need to make æsthetic choices in the context of musical creation.

**Chapter 8** shall, as a final overview, go over this musical portfolio and examine the potential possibilities for performance and how physical environment may be affected by or affect the music being performed. It shall explore the possibilities of interaction between composed and performed physical space within electroacoustic music and make some suggestions as to how one may approach this within my portfolio.

In conclusion, this written document ties together all of the various ways in which notions of environment might be found in the portfolio of accompanying compositions. Although these are not intended as a comprehensive taxonomy of terms and concepts, or an exhaustive list of how notions of environment have been explored elsewhere, the document does conclude with certain overarching ideas about the future use of environmental materials both within composition and performance; key themes which have been explored and discussed throughout are briefly summarized, and ideas for further research in the field of environment in acousmatic music are presented.

## 1. Éclats de Feux

The first composition in this doctoral portfolio, *Éclats de Feux* (10'07), is a stereo acousmatic piece composed between 2014 and 2016 at the University of Sheffield Sound Studios (USSS). The title refers to the impressive bonfire nights and, seemingly, endless fireworks encountered during the first few weeks immediately following my arrival to the UK. '*Shards of Fire*', translated into English, also represents the extent to which one's life may be completely changed with a single act of travel.

Through the presentation and analysis of *Éclats de Feux*, I aim to introduce key concepts which I have explored in this composition portfolio. This will include the importance of field recordings, writing techniques within electroacoustic music, how the presence of environment informs structure and form, and how those environments can go from their original state to a poetic one.

### 1.1 Physical & Cultural Environments

My interest in environmental sounds incorporates both their physical and cultural notions of environment. In this section, we consider the similarities and differences between these two terms, and this paves the way for a discussion about *Éclats de Feux*, in which both of these notions may be encountered.

The physical (acoustic) environment, most often referred to as 'space', has been widely researched and discussed in the field of electroacoustic music[2]. For example, Smalley's spectromorphology[3] directly follows the description methods found in Schæffer's typo-morphology[4], listing physical properties and classifying them in grids. For the purpose of this thesis, I will define the physical environment as the acoustic surroundings of sound. Manifestations of this in the sound itself may therefore be the sense of space, of room or of container, for example. There may also be instances where the limits of these surroundings seem to be somewhat problematic to define. Consider these two paragraphs by R. Murray Schafer:

> Community can be defined in many ways: as a political, geographical, religious or social entity. But I am about to propose that the ideal community may also be defined advantageously along acoustic lines.
>
> The house can be appreciated as an acoustic phenomenon, designed for the first community, the family. Within they may produce private sounds of no interest outside its walls. A parish was also acoustic, and it was defined by the range of the church bells. When you could no longer hear the church bells, you had left the parish. Cockneydom is still defined as that area in East London within earshot of Bow Bells. This definition of the community also applies to the Orient. In the Middle East it is the area over which the muezzin's voice can be heard as he announces the call to prayer from the minaret.[5]

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[2] A number of well-known researchers in the field have published a wealth of material on the subject. These include, for example, Barrett, Bayle, Casey, Chion, Harrison, Merlier, Oliveros, and Smalley to name a few.

[3] Smalley, D. (1997). Spectromorphology: explaining sound-shapes. *Organised Sound, 2*(2).

[4] Schaeffer, P. (1966). *Traité des objets musicaux* (1977 ed.). Paris: Seuil.

[5] Schafer, R.M. (1977). The Soundscape: Our Sonic Environment and the Tuning of the World, Inner Traditions / Bear & Co, p. 215.

Here, Schafer agues for the determination of communities by their sonic properties. Of course, in the example of determining up to where the church bells are heard, the delimitation will be extremely variable, depending on a multitude of factors, such as weather, urbanism, the level of sonic activity in the area, without mentioning the listener's hearing capacities, health, and attention, amongst other things. In other words, physical environment in sound and consequently electroacoustic music may be measured to some degree, with approximate and varying delimitations.

Paul Rodaway offers additional information, especially in regards to the social aspect of soundscape, in his definition of it:

> The soundscape is the sonic environment which surrounds the sentient. The hearer, or listener, is at the center of the soundscape. It is a context, it surrounds and it generally consists of many sounds coming from different directions and of differing characteristics… Soundscapes surround and unfold in complex symphonies or cacophonies of sound.[6]

This, again, supports the idea that the presence of the listener has a strong impact on the reception, and therefore perception of the soundscape (or sonic environment). Interestingly, Schafer also mentions the idea of community; this is, arguably, an important aspect of cultural, rather than physical, notions of the environment. Unlike notions of the physical environment, which may be understood through relatively straightforward ideas and concepts, cultural notions of environment are much more ambiguous. According to Jeff Lewis, professor of media and cultural studies at Royal Melbourne Institute of Technology, culture can be defined as such:

> *Culture* […] is constructed out of consonant and aggregating meanings that are shaped in relation to a given social group's values, ethics, interests and ideologies. Culture may become evident in the material text (speech, image, sound, words) and in practices (human actions, audience behaviours, and so on). However, […] culture is also dynamic and replete with disputes over meaning and various claims for meaning primacy. New meanings are shaped in terms of ceaseless interaction of humans and their diverse communicational forms. […] this dynamic contributes to the transfer, implosion, creation and re-creation of meaning.[7]

As we can see from this statement, culture is seen as being dynamic and ever-evolving. Assuming that this is correct, it is immediately clear why we might have more trouble defining cultural environmental notions when compared with their physical counterparts; the former, unlike the latter, cannot be so easily measured. Furthermore, since culture is always in a process of creation and re-creation, its identification is highly subjective. Indeed, one person can, and often will, have various different readings of the same cultural environment; such is the complexity of sounds that have a strong cultural leaning. This relies also on a person's own experiences and memories, and with memory comes the idea of *place*.

As a note on the concept of *place*, it is worth taking a look at how Katharine Norman describes it:

> Whereas space is delineated by extent (even if infinite), a place begins and ends with a relationship between the perceiver and the perceived. So, I measure

[6] Rodaway, P. (1994). *Sensuous Geographies.* London and New York: Routledge.
[7] Lewis, J. (2008). Cultural Studies: The Basics (2nd ed.). London: Sage, p.6.

> whether there is sufficient space for my new piano against the sitting room wall, but the place where I bought it is defined by lived experience.[8]

Thus, for me, the idea of place is very much aligned with the understanding that culture is a dynamic process. Much like culture, place is shaped by experience, most likely brought and understood through the lens of a community.

In summary, I consider physical environment, or space, to be the physical surroundings of sound. These surroundings are defined by acoustic principles and can also have clear and unclear boundaries. Cultural environment, however, is a social context, manifested in text (such as defined above by Lewis: speech, image, sound, words) which carries meaning. Within electroacoustic music, it is a fluid surrounding of sound which is more easily understood via the presence of a community or a given social group[9].

## 1.2 Importance of (Field) Sound Recordings and Their Impact on Meaning

As a composer, I value the use of varied sound sources when creating electroacoustic music. In this context, field recordings occupy a particularly significant position within my work; no two field recordings are ever the same. This is not the only reason why I choose to use field recordings; unlike sound synthesis or studio recordings, field recordings usually garner interest for their (almost always) recognisable environmental cues; field recordings offer traces of both physical and cultural environment from the very start of a compositional project.

Field recordings are at the heart of *Éclats de Feux*. The original idea for this work stemmed directly from the abundance of field recordings I had gathered and that inspired me to have these sounds as the main expressive content. During the gathering of field recordings for this piece, I was interested in both the physical and cultural aspects of environments that were encountered. As a general rule, two factors guided my choice of sounds: their sonic peculiarity and their provenance. The sonic originality found in these different recordings was important for creating a diverse stock of sounds, whereas their provenance contributed to create meaning and personal poiesis.

Given what is said above, it is perhaps important to clarify my vision of meaning and poiesis in the context of electroacoustic music composition. Meaning, for me, happens when there is an association of ideas or a connection between two experiences. For instance, in a given electroacoustic piece, the iteration of one salient sound object can create meaning inside the musical form. Whilst field recordings already create their own part of meaning by being connected to a previous experience, I give them more meaning in the musical context, by using patterns, creating salience, and using some of these key sounds as formal markers. At the start of *Éclats de Feux*, for example, we hear a significant event introduced at 0'16. This sound event is fairly complex; it has a nervous energy, a complex spectral mass and a varying dynamic profile. As such, it is something of a salient sound, occupying much of the foreground. It lasts

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[8] Norman, K. (2012). Listening Together, Making Place. Organised Sound, 17(3), pp.257–267.

[9] As suggested above, community (or, in Lewis's words, a given social group) is a large aspect of culture. As it turns out, community is also a major point of interest in my compositional approach. Throughout this thesis, we will observe some of the diverse occurrences of community in the proposed musical works. For instance, the geohistorical Estonian communities presented in *Omega 3* are completely distinct from the gaming communities involved in *Border Crossing*. As for their presence in *Éclats de Feux*, it is expressed through a variety of environmental sound recordings, which I will address in the next section of this chapter.

until 0'30, but returns at 0'43, then 0'54, 3'13, and so on. In this context, repetition punctuates different segments of the piece, therefore creating meaning by association and coherence in the musical language.

Another way to create meaning would be to write in such a way that an emerging musical pattern evokes an extra-musical reality. An example of this is found at 1'56, when one of the auditory streams[10] features a sound object with a complex mass having an iterative behaviour in a regular rhythmical pattern. As a cultural experience, this is reminiscent of mechanical sound patterns, particularly that of the train. This is an association of ideas that can be created regardless of there being an actual recording of a train used as musical material. As a matter of fact, it might even become more practical to use a label (such as 'train') to identify this sound, rather than constantly referring to it as an abstract sound, or by reference to its physical properties.

As we have just seen, it is possible, with the use of abstract sound objects (as in not having an immediate recognisable source-bonded[11] nature), to invoke notions of environment. In fact, this is possible with the use of any type of sound, provided that it creates a clear reference to the experience of an environment. However, the effect is not automatic. For example, the idea that a highly transposed synthetic sound might trigger the memory of a bird chant does not necessarily imply the understanding of a whole new environment. After all, music has the ability of creating surreal constructs in which different musical objects may or may not be related to known environments. Furthermore, even when these sounds (for example the bird chant) may be instinctively linked to known environments, their presence in a musical construct might not imply the entire environment from which they could have been extracted.

Consequently, for an environment to be suggested, there usually needs to be implied the trace of an environment, be it real or constructed. This can happen directly, for instance when a field recording clearly suggests a space (for example the acoustic qualities of an urban park or an art gallery). With other types of sound objects, it can be the use of a sound processing effect (for example the use of a reverberating effect based on impulse-response, or a mathematical delay). In other cases, it can happen by way of musical construct, especially when there is the presence of a foreground interacting with a background. More often than not, the listener will tend to interpret this as a form of depth of field. This, of course, can be an entirely constructed and therefore poetic environment, which does not automatically refer to a known

[10] Concept taken from Bregman, A. S. (1978). Auditory Streaming: Competition among alternative organizations. In, *Perception & Psychophysics*, 3(5), 391-198. The concept of auditory stream is much like that of a musical line, but is more than phrasings. It is focused on the presence of different sound objects in time and how they interact to create a polyphony. This term is widely used, in French as 'courant auditif' when relating to different levels of musical lines, especially within the tradition of electroacoustic music. The reason we do not simply use the term 'musical lines' is that 'streams' imply the possibility of various changing types of voices, affected by different sound objects aggregated into these voices. Often, they are differentiated by their place in the spectrum and their behaviour. This explains Bregman's original use of the idea of 'competition' among organisations.

[11] Smalley, D. (1994). *Defining Timbre, Redefining Timbre.* Contemporary Music Review Vol. 10, Part 2. London: Hardwood.

environment and thus, will likely be to create personal meaning according to the listener's experiences and act as a metaphorical environment.

Yet another way to create meaning, for me, is intrinsically related to a composer's poiesis. There are some approaches within electroacoustic music that favour giving importance primarily, if not solely, to the sound material's plasticity and sonic attributes in order to make æsthetic decisions ( for instance, *De Natura Sonorum* by Parmegiani[12] or *Évidence matérielle*[13] by Harrison). In my case, however, I value the moment of recording as an experience in itself. During, and following, the act of recording, I start to build an array of references which connect sounds to their original context. I do not feel the need to communicate the same experience to listeners, nor do I seek any kind of narrative form related to such experiences. I do hope to convey a sense of wonder with my choice of sounds. By this, I simply mean that sound objects are more than mere abstract materials: they intentionally carry information about their context, and if that context can inspire my personal poetry (i.e. poiesis), then it is worth exploring through the act of composition. Moreover, when there is, in fact, a connection to a specific social group or community, it becomes, for me, even more relevant to highlight the presence of that community by including it in my expressive process. In the specific case of *Éclats de Feux*; several local sounds are heard throughout the piece. Here are examples of these in the first minute of the composition:

- 0'00: the introducing sound is taken from an air pump in a Kelham Island garage;
- 0'10: the bell struck at that moment is one heard at the National Museum of Emergency Services in Sheffield;
- 0'16: the sustained grainy pitch introduced here is from Argent Steel, a steel works company near Furnace Park, Sheffield;
- 0'20: the voice of the man is that of a worker at Argent Steel;
- 0'50: the melodic bells are from an MBTA[14] Subway station in Boston.

These sounds carry a particular meaning for me; they are unique in their acoustic manifestations. However, they are ultimately connected to several of my own experiences. More specifically, they reflect my own experience as a traveller from North America discovering Northern England. It gives me poetic inspiration, and provides æsthetic direction to the composition, regardless of what is ultimately received and read by the listener.

Whilst these sounds carry meaning for me, their original context is not necessarily the primary focus of my interest. If I were primarily interested in their original context, then I would probably decide to compose soundscapes. There is, of course, nothing wrong with the soundscape tradition. However, since soundscape is often linked with a certain political stance (of which acoustic ecology is a strong branch) it tends to give more value to non-urban sounds, which, from my perspective, makes it difficult to connect with communities. For very similar reasons, Luc Ferrari has mentioned that he was not comfortable with being labelled a 'soundscape artist':

> I've always felt awkward about the term "soundscape" because of its association with an ecological stance. Murray Schafer or Pierre Marietan conducted

[12] Parmegiani, B., (1975). *De Natura Sonorum* [Vinyl] Paris : INA-GRM.
[13] Harrison, J., (2000). *Évidence matérielle* [CD] Montréal : empreintes DIGITALes.
[14] Massachusetts Bay Transportation Authority

> soundscape experiments where there was the least amount of noise pollution, outside of any reality with regard to the modern soundscape, which nobody can imagine without the sounds of highways, planes, railways, etc. You can't romanticize the silence of yore, which was certainly invaded by dreadful noises: carts, horses, etc. […] As for me, what I'm trying to render audible is the city or the country with the tractors, the traffic, the background noise of phone lines, the people on the sidewalk, the music coming out of the open doors of shops—everything that makes up our urban or rural environment.[15]

In much the same line of thought, I have interest in communities which contribute to the surrounding cultural environment from which the sounds are taken. With this in mind, we shall now examine *Éclats de Feux,* paying particular attention to the writing techniques used with these same sound objects for this piece.

## 1.3 Writing Techniques

In order to discuss *Éclats de Feux*, I have divided its form into seven segments:

1. 0' — 1'07
2. 1'07 — 3'33
3. 3'33 — 4'40
4. 4'40 — 5'30
5. 5'30 — 7'10
6. 7'10 — 8'01
7. 8'01 – 10'07

Each segment contains a number of phrases, built upon different writing techniques. These techniques are most often chosen according to the material that is featured. By choosing to discuss its writing techniques, I wish to demonstrate how, in my approach, the original material affects the overall musical result. Whilst I do not think that it is necessary to analyse the whole piece, a look at the first two segments should help to understand my compositional process within *Éclats de Feux*, and some of the ways in which the concept of environment is manifested throughout.

### 1.3.1 A brief look at the first segment: impact and sustain

The first segment of *Éclats de Feux* mainly uses a contrast between impact and sustain. Sound events carrying impacts are heard at 0', 0'02 (air pump), 0'10 (air pump combined with bell), 0'16 (end of bell sound contrasting with active, high-frequency complex mass derived from fire explosions), 0'42 (low-spectrum thunder-like impact), 0'58 (low-spectrum impact derived from metallic object), 1'06 (high-spectrum impact derived from metallic object). Those impacts are used as pivoting events to direct the focus of the piece, introducing a different sound material (which often suggests a specific environment each time.) In other words, these impacts have the function of interrupting the discourse to change the perspective from the previous environmental sound object to the next.

Between the first and the second impact, one hears a sudden change of environment. Within the first second, after the first air pump impact, there is the exposition of the sound of an outdoor scene, which is quickly replaced by an indoor soundscape (reverberating voices

[15] Caux, J. (2012) *Almost Nothing Wit;h Luc Ferrari: Interviews with Texts and Imaginary Autobiographies by Luc Ferrari*, Berlin Errand Bodies Press, p. 109.

indicate a closed space) after the second impact. This is then briefly interrupted by the bell's sustained tone, which creates an effect of suspension (by not revealing a new realistic[16] environment immediately). The suspension is extended at 0'16 with nervous and complex sounds superposed to another tone. Hints of a community are given when a man's voice is heard at 0'20. The sustained sounds have a densely-filled spectrum and thus make it difficult to picture a clear environment.

The environment changes once more at 0'44, after the next impact. By 0'47, less complex tones are heard and, with their lack of mid and high spectral qualities, these suggest a greater (or at least wider) environment.

This environment is also discontinued at the moment of the last impact, at 0'58, where even lower-pitched tones are introduced. Not unlike the bell's sustained tone, there is here, once again, an effect of suspension created from a metaphoric environment.

### 1.3.2 Segment 2: Layering and Build-up

After the final impact of the first segment (0'58), the writing style completely changes. In this new section, we do not move quickly from one environment to the next. Rather, a slower dynamic can be heard. This contrasts with the previous segment and introduces a flow within one main metaphoric environment, in which cues are not so much spontaneous events as they are constructs built over a longer span of time. Moreover, the environments created are much more poetic than in the first segment, where pieces of original field recordings can be heard. Instead of switching from one clear reference to a real environment to the next (even with added, obviously foreign sound objects, such as the active complex mass almost entirely masking the steel works at 0'16), the progressions here are much less clear-cut. If the first segment was essentially presenting 'snapshots' of field recorded environments loaded with information, the second segment instead proposes juxtaposing slower evolving elements of recorded environments, which may make it more difficult to establish a clear reference.

For example, the prolonged resonance from the impact at 1'07 fading into a melody of which the timbral contours blend with that same resonance sound blurs the realistic quality of anything which could be taken as the direct acoustic soundscape recording of an observable physical space. The change of landscape is brought by æsthetic association, an artistic and arbitrary connection made as a personal compositional choice. This æsthetic approach is quite similar to that used by Francis Dhomont in *Espace/Escape*. In this piece, for example, the sound of a vehicle's horn (1'56") is extended, through reverberation, and blended with a sustained piano chord, using a source-bonded material within a largely metaphoric environment. In this case, instead of having the pure function of referring to a known environment, it contributes to the musical construct already in place.

Even though acoustic elements suggest the idea of a room (such as the distant-sounding squeak at 1'52, and the vaguely reverberant, processed male voice which seems to be heard

[16] I will make a point to make it clear here that I use the term *realistic* not to refer to the unrecognisable quality of the bell's sound, but rather that if there is a perceived environment, surely it is not the representation of a material space in which one may physically enter or leave. It would be much more likely to be a culturally constructed, poetic *place* or the sonic metaphor for an environment which here, would be more akin to dreams than to directly relatable environments.

through a train station PA system at 1'59), the environment is much more of an æsthetic construct than the realistic representation of an experienced physical space.

Within this construct, musical evolution takes place, with slow build-ups in which the lower auditory stream (sustained base tones or simple melody) is present throughout. It appears clearly for the first time at 1'19, where the bell melody emerges from the previous reverberation trail. Its melodic profile is also a guiding element for events affecting the other auditory stream. At 1'46, where one of its melody phrases concludes, a new sound material is heard: a low frequency, complex mass, with an iterative rhythmical pattern. This pattern fades out as the baseline re-emerges in the foreground, which reveals the bell melody once again.

At 2'22, a new auditory stream enters as the baseline (bass-like sounds at the lower end of the spectrum) goes even lower. This stream also has a rhythmical pattern and a complex mass, but has a great deal more mid-high frequencies, which cause it to take over the foreground. Additional rhythmical material appears at 2'28 and, from then on, streams are piled up on top of each other whilst the baseline grows in timbral complexity and amplitude. By 2'42, previously introduced materials are then heard at the same time, with the return of the first segment's bell resonance at 2'46. By 3', streams are multiplied, filling the spectrum and creating a dense musical moment. More and more materials are added, almost exponentially, to accelerate the build-up and lead to a final, essentially white noise, sound, concluding on a single high pitch fading away in a complex (as in having a complex mass) reverberation.

### 1.3.3 A note on contrasting writing techniques

Using these two distinct writing techniques achieves two things. Firstly, it creates contrast between the two segments, in an effort to keep the music engaging. Secondly, it introduces two different impressions of environment within the music. Whilst sound materials may be used in both segments (such as the bell melody and the bell resonance), the effect is entirely different from one segment to the next.

In the first segment, most of the dynamically sustained parts are identifiable recordings of spaces; they are largely unprocessed, and therefore partially identifiable. This creates an effect of multiple 'windows', by which many environments are quickly introduced and set the tone for the piece: a diversity of spaces and places, with a conscious and deliberate choice to use source-bonded and recognisable material.

The second segment has a much more gradual writing style. Where in the first segment, there would be almost a systematic flipping through 'windows' of different environments, here the environment evolves progressively. The build-up is much steadier, juxtaposing different auditory streams to create an environment which is much less readily identifiable. The transitions are fluid and over longer periods of time, with bridging sound material (such as the reverberation tail at 1'07) instead of sudden events (such as segment 1's air pump). This creates an evolving sense of *place* rather than *space*, fluid and fleeting like a memory.

This is where the importance of cultural environment becomes defining in my composition. I have vivid memories of being exposed to communities around Sheffield, having recently left North America. This is expressed in a much more eventful writing style in the first segment, whilst the second is considerably less active, exhibiting qualities of a meditative introspection, introducing a dream-like state with sounds of my own personal, more distant memories.

As mentioned above, I do not wish to *render audible* specific soundscapes, but I do wish to express different æsthetic ideas. In the case of *Éclats de Feux*, the main idea was the travel from my original home to a new one. The writing techniques serve to express this, through the contrast between the first two segments. Different materials may have resulted in a similar approach to this form. However, the materials chosen, and their cultural provenance (environment), have obviously influenced how they were ultimately used and their overall effect.

In the next section of this chapter, we shall consider how the overall use of contrasting segments affects the form of the piece, and how environment and music both influence each other in my compositional approach.

## 1.4 Structure & Form: Contrasting Environments

Having established two forms of æsthetic environments within the first and second segments of this piece, I shall now briefly discuss the rest of the piece to explain its structure in the greater form.

When looking at the dynamic profile of *Éclats de Feux*, it is possible to find an internal logic; the use of certain environmental recordings and the construction of musical environments intertwine. Keeping in mind that segment 1 was highly eventful, frequently switching between scenes, and that segment 2 had a much slower build-up, I shall briefly go over the remaining segments of the piece:

- Segment 3 (3'33) continues the suspension, but uses sounds similar to those found in the first segment, re-introducing them before a final event which creates a switch of environments;
- Segment 4 (4'40) goes back to the writing style found in segment 1 but with added layering;
- Segment 5 (5'30) starts suspenseful but quickly opens up into layered active sounds;
- Segment 6 (7') starts with active sounds which progressively diminish into a meditative state;
- Segment 7 (8'01 to 10'07) opens up to an outside soundscape juxtaposed with abstract musical lines.

Without going into excessive detail, what happens most often, from one segment to another, is a push and pull between active, fast-paced writing and static, slow development. Most of the eventful sections have easily recognisable sounds, or soundscapes, such as the air pump/child voices in the first segment, machinery/child voice in segment 4, and machinery and human voices in segment 5 (although, here they can be often masked by other active sounds, especially the complex high-mid mass). Within segments 2, 3, 6, and 7, which have a typically more meditative style, abstract sounds dominate, although they are not exempt from recognisable sounds, such as the train-like motion at 7'33 in segment 6 or the obvious male voices throughout segment 7.

This information reinforces the tendency observed in the previous section, where the first two segments involved different writing techniques, and the overall style expressed different environmental ideas derived from the musical material itself. The final result is neither a complete, direct reproduction of a soundscape, or an absolutely abstracted musical

environment. The content informs the container and vice-versa. For example, clear-cut changes in segment 1 were inspired by the aggressive quality of events chosen (such as the air pump sound). The sounds in between those changes did not, otherwise, specifically orient me toward one or another writing technique or style. Rather, this technique was helpful for conveying a sense of stimulation caused by the sound materials which bring powerful dynamic changes. In the same way, the melodic and reverberating low-spectrum bells of segment 2 led me to use a more progressive musical build-up. This, in turn, helped convey my personal poiesis; a sense of introspection, a connection to inner memories, contrasting with the previously relentless succession of stimulating experiences.

Whilst we have seen, in this section, how subject and form inform one another, I shall briefly discuss, in the next section of this chapter, some of the different states of environments used throughout my music. The ideas below are not merely applicable to *Éclats de Feux,* but also to the rest of my portfolio.

## 1.5 Original to Modified to Poetic Environments

As with my other compositions, ideas of environment appear in different forms throughout *Éclats de Feux*. In this case, unprocessed field recordings act as a trace of the original environment, which is both physical and cultural, acting as both subject and form. Rarely do I use field recordings without processing them or integrating them with other elements. This is because, as mentioned above, my goal is not to compose soundscape or otherwise render audible the original experience of an environment[20]. Instead, original environments and subjects are often connected, I do like to use recognisable parts of those field recordings in order to anchor the piece to its origins.

Whilst I like to keep glimpses of the original acoustic environments present in my recordings (such as in the first segment), I also believe that processing such sounds, as one might with any other sound object, is significant in the context of composition; it gives me a wider palette to choose from, but can help with bridging abstract sounds with more obviously recognisable ones. For instance, the melodic bells of the second segment, whilst still recognisable, have been dampened and modified to blend more seamlessly with the previous sound (a reverberation tail). This allows me to go from an event which would otherwise have no connection with the introduced sound (bells) and blend it into an organic progression toward the next environment (segment 2).

Cultural and physical environment are embedded in the original field recordings. Although I am deliberately modifying the originals, a trace of environment remains as the sound is transmuted to a different state. The bells in segment 2 are a good example; another example could be the initial bell's resonance which reappears throughout the piece (first at 0'11), sometimes stretched, sometimes reversed, yet another could be the filtered voices throughout segment 7. That I process those sounds, combined with the fact that these sounds (whether in their original or processed form) are used to create new environments, produces a poetry, a consequence of my personal æsthetic choices.

[20] I would like to note here that even with the direct reproduction of the physical, acoustic reality of that environment, the cultural and personal experience which took place at the time of recording is created into a memory, and therefore is an ever-evolving process. This is why, ultimately, in my view, there is no such thing as an accurate and total representation of any given environment.

This poetry is what results from unexpected associations or sonic images that would not happen if it were not through music. Through the process of composition, I am able to create new, poetic environments, which are neither soundscapes nor completely abstracted musical forms. Consequently, a new manifestation of physical environment emerges, and a new level of meaning is produced.

### 1.6 Conclusion

Using *Éclats de Feux* as an example, this chapter has discussed the importance of field recordings in my compositional practice, how considered how these recordings are used with some of the different writing techniques that I employ. This in turn informs the content and the form of my compositions. During a brief discussion on the different states environment can have, from original to modified to poetic, it was noted that field recordings retain their physical and cultural qualities. In the next chapter, we shall have a look at *Omega 3*, a piece that involved a site-specific environment and a live performer, and again observe related ideas about environment.

## 2. Omega 3

*Omega 3* (18'18) is a stereo, acousmatic piece composed and designed to be performed on-site at an old linseed sorting factory in the Mooste parish of Estonia. The project started out during a residency offered by MoKS[21]; an artist-run space where I was collaborating with a live accordion performer (Tuulikki Bartosik[22]). Given Tuulikki's background in traditional folk and, crucially, improvisation within folk, the work was initially designed to be performed live, within the factory complex; the piece was designed to allow various acts of free improvisation. Following this initial stage, I subsequently revisited the roughly composed parts, to create a standalone acousmatic version of the piece. Accordingly, as is discussed below, this piece was designed with a specific environment in mind, determined by the artistic residency and the subsequent reworking of location recordings.

This chapter considers the presence of physical environment with its site-specific quality and how cultural environment is made more obvious through the collaboration with a local live performer. It goes on to discuss the challenges that came out of reworking a piece previously designed to be a live performance, and adapting it to be a standalone acousmatic piece altogether. It concludes with a discussion surrounding its portable format and how its site-specific qualities impacted its musical contents.

### 2.1 Site-specific Composition: Physical Environment

Before I further the discussion in which I distinguish physical and cultural environment, I shall consider important to stress that even though one might approach each concept individually, they are extremely difficult to separate, because one implies the other and vice versa. Notions of physical environment are surely defined by cultural perspectives provided by a cultural environment, in the same way that a cultural environment can hardly exist without its physical reality. Not only do they need each other's presence to be understood, they also constantly

[21] MoKS., (©2018). [Viewed 27 September 2018]. Available from: http://moks.ee
[22] Bartosik, T. (©2018). [Viewed 27 September 2018]. Available from: http://tuulikkibartosik.com

interact and influence one another. Physical and cultural environments rely on each other to be defined and shape each other's existence, in the same way that a parish can be defined by a community's sounding church bells. In a similar line of thought, consider this reflection made by Catharina Dyrssen in *Are we still pretending that spaces are boxes?*[23]:

> Through sound we share the everyday experience referred to by Michel Foucault as heterotopias: multi-layered, changing states in time and space, unique, complex configurations that vary in relation to the environment and can be opened and closed with differing degrees of accessibility. […] Thus every place is both an inter-space, an in-between-space, and many different places, where the private and the shared, the physically close and distant, the acoustic and the visual are all over-layered. A backdrop of urban noise, with all its sound artefacts, including traffic, ventilation systems, escalators, the buzz of cafés, muzak, advertising messages, etc., is often a surge of sounds with a blurry relationship between foreground and background, and with unclear boundaries in public spaces between the visual and the audible, the individual and the collective, the separate and the inter-related.

The very fact that so many ideas cohabit in such a limited amount of text underlines the complexity of the realities evoked: environments exist in a multiplicity of realities, physical, cultural, collective, individual, and so on. I found Dyrssen's point especially relevant as she starts off with sound as a reference point. This reflects very well my experience as a composer: the sound, which is a result of my music and a trace of the environments from which it comes and where it is manifested, informs on and interacts with those said environments. There are complex ramifications in every variant of the reality of sound, and whilst I am aware that it might be risky to approach them from separate angles, I have also come to the realisation that the notion of cultural environment has not been discussed nearly to the same extent as physical environment (i.e. space) within the electroacoustic music literature. Furthermore, whilst the importance of culture and communities within the tradition of electroacoustic music has always more or less been on the fringe of the main focus of interest, which is, after all, music, issues surrounding community, culture, and cultural appropriation are all found in topical discussions. For these reasons, I believe that, in order to be up to date with our global reality, it is important to include and discuss the notions of culture and communities whilst reflecting on artistic topics.

I am well aware that if I am to observe a site-specific composition through the lens of physical and cultural environment, it is nearly impossible to separate the two. However, for the purpose of practicality, I have chosen to associate mainly physical environment to the location and cultural environment to the collaborator. This helps me organise my ideas in a way that might make them more readily identifiable. For instance, it is obvious that a linseed sorting factory, found in the woods of Southern Estonia, next to a small village which has roots that link to ancient Livonia, German estate investors and Latvian trade, constructed under the USSR's reign, has cultural implications. However, that standpoint was not my first focus as a composer, when I first approached the composition of *Omega 3*. In my experience, the cultural aspects became much clearer through interacting with Tuulikki. Having had next to no experience with the Estonian country when I started the composition of *Omega 3*, what was immediately most obvious was the physical environment. Not only that, but the very first thing

[23] Dyrssen, C. (2007). Are we still pretending that spaces are boxes?, in LARM: From mouth cavity to laptop: the sound of Nordic art, Kabusa Böcker, p. 23-27.

I did during this project was to record sounds on site. The reverberation and resounding metal structures of the linseed sorting factory were, in my immediate understanding, much more prominently the result of a physical environment than that of a cultural environment. It is only later, through interacting repeatedly with the performer, who has years of history with that location, that the cultural aspects were made much more obvious. With this being said, I shall now go on to examine some of the physical aspects of *Omega 3* through its site-specific quality.

The linseed factory, an ancient building in the Estonian municipality of Mooste, sits deep in the woods, surrounded by derelict objects. Many of these objects are featured during the initial stages of the compositional process; just as one might improvise in a recording studio, we explored the various sonic possibilities these found objects offered, as a point of departure. In doing so, the factory environment was almost always audible: substantial reverberation, resonating metal structures, low frequencies emphasised by the size of the room and even sounds from the forest (such as the wind in trees or birds singing) were almost always present. As the bank of recorded sounds grew, the Estonian factory environment became an increasingly prominent part of the composition, imposing its spatial character upon the materials that were selected and, ultimately, employed. At first, it seemed as though this might become something of a restriction, narrowing the spatial content of the work, and thus preventing complexity or diversity in this regard. In fact, however, the fact that the various sounds were all recorded in the same physical space has an enormous benefit; the sounds employed were immediately connected through the spatial similarity and, far from a restriction, this directed some of the many ways in which I approached sound processing and manipulation and, crucially, the large-scale form of the piece.

In terms of actual musical material, the sounds which were directly available in that environment, apart from being impressed by the environmental signature of the given space, were obtained from objects readily accessible in the factory. Those objects were most often factory-related tools, such as metallic (nails, brushes, frames, poles, machine structures) and wooden (boxes, planks, brooms, table surfaces, blocks) objects. Those are sound elements which, in this piece, tend to fill the greater arcs of the formal structure. When used, these sound materials are mostly layered and with a lot of dynamic activity, thus not immediately contributing to the general dynamic profile in the sense that they often describe micro-gestures contained in the larger phrases and form. Such elements can clearly be recognised, almost non-processed, for example, at 6'10 where metallic scraping sounds interact with the abrasive high-pitch sound, arriving suddenly and forcefully to create a change in energy. The high pitched material is regular, monolithic and steady in its development; the shorter, spectrally complex, scraping sounds help to support the otherwise static material at the foreground. With those timbrally complex sounds comes a rhythmical pattern (still at 6'10), supporting the general energetic profile of the section. While these internal layers have their own, distinct, energetic developments, they are not sufficiently prominent so as to take over the larger, heavier structure imposed by the undisturbed and plain high pitch. It is only when this one fades away that the structure becomes more influenced by the rhythmical material, which becomes foregrounded around 6'40. Thus, between 6'40 and 7'04, ambiguity briefly sets in exactly at the moment when this high-pitched element weakens. This is temporary though, as it comes back quite noticeably after 7'04 to reinforce its stability, until it finally disappears as suddenly as it appeared. This makes way for a different section altogether. This section of the piece (between 6' and 7') is a good example of sounds originating from the type

of objects available on-site. The sound of the room itself can be heard throughout the piece at varying levels, but rarely is it a simple room 'colour', in the sense of a unique reverberation that it would give to the sounds of the piece. There are hints of the original space where the sounds were taken, for example at the very beginning, when birds are heard singing as well as wind in tree leaves. There are also, at times, instances where the human voice is coloured by a resonance of the metal structures it is heard through, such as the vowels resonating at 14'35 or the trace of a reverberation around the high-pitched voice at 15'10. Yet another, maybe more pure in the sense that it is not processed as much and is accompanied by less surrounding sounds, a minute later at 16'20, is an example of those structures shaping the sound of the voice. However, as the writing of the piece itself is based on a considerable amount of layers, thus making its style also environmental, it may be difficult to discern clearly which effect is in fact the one drawn from the original site itself. This is a particularity in my style of writing: I tend to use several layers and make them interact with each other, as was the case previously with *Éclats de Feux*. As I have discussed this approach in the previous chapter, I thought it best to explore, with *Omega 3*, concepts which were not previously discussed, such as site-specific composition and working with a live performer.

In summary, the physical aspect of the environment which was the set of the conception of *Omega 3* is a combination of the room imposing its acoustic space and the sounding objects readily available in that specific space. Those objects alone are not defining in terms of formal decisions, but give a distinct quality to the piece, which contributes in anchoring it into the setting of the linseed sorting factory of Mooste. In the next section of this chapter, we shall see how the collaboration with the performer informs on the presence of cultural environment surrounding *Omega 3*.

## 2.2 Working with the Performer: Cultural Environment

Tuulikki Bartosik, who joined me in the composition process, is a performer of improvised folk music, alternating between the accordion, voice[24], and kannel[25]. Early in the collaborative process, it became clear that her instruments, background and performance abilities would determine a large part of what was ultimately accessible and usable within the composition.

The accordion is very well-known within folk contexts and, as a consequence, I strived to avoid clichés within the finished piece; I looked for sounds which were not typical of the instrument, either because they are impossible to hear without amplification, or simply because the instrument was not originally designed to produce such sounds. For example, at the very beginning of the piece a complex sound mass, resembling a long breath, is accompanied by some crackling sound objects. The breath-like sound is derived from movements of air in the accordion as it is pulled open and pushed back, without any note being played. This is a fairly recognisable sound, occasionally heard within folk performance. By recording it with a close microphone technique, I was able to make use of certain characteristics, to the point where it became a foregrounding auditory stream. The crackling sounds were produced by folding the

[24] Tuulikki was mostly using a *kulning* technique, which is a typically Scandinavian vocal technique originally developed in rural regions for the function of herding livestock. Rosenberg, S. (2014). Kulning – an ornamentation of the surrounding emptiness: about the unique Scandinavian herding calls. (R. U. Music, Ed.) *Voice and Speech Review, 8*(1), 100-105.

[25] Estonian traditional instrument using plucked strings; comparable to the zither. Rüütel, I. (n.d.). *Kannel.* (O. U. Press, Ed.) Retrieved 10 17, 2017, from Grove Music Online: http://www.oxfordmusiconline.com/subscriber/article/grove/music/L2232552

fabric of the bellows as air was being drawn in and out of the instrument. In such sounds, I saw an opportunity to provide an instrumental correspondence to the various creaking and crackling sounds taken from the factory.

Another example is the faint, high-pitched sounds that appear throughout the piece, but are particularly present at 7'15. This material is melodic, and therefore not completely alien to the instrument, but extremely quiet within the mix. If those sounds were meant for live performance instead of being encoded on fixed media within a determined audio mix, such materials would have had to be produced on the accordion loud enough to project within the space (which was fairly large), and this would have presented something of a challenge to the performer. In this particular case, however, it is amplified as soon as it is performed, and presented over an array of loudspeakers[26]. The piece is thus built upon sound materials produced by the accordion, without being restrained by the normal conditions of live performance. This gave me a very wide palette of sonic nuances and subtleties while arranging the different auditory streams and thinking of the overall musical idea, while still including the live instrument in the performance. However, as it is now, the acousmatic version of the piece included in this portfolio is not a simple recording of her performance and a previously composed part on fixed media. Most of the musical material produced by the performer during the live performance has been recorded separately and reused in the final mix, which is a blend between the already fixed part and the newly added sounds. The specific approach to this work is further described in the next sections of this chapter.

In addition to the accordion materials, Tuulikki produced a range of improvised vocal melodies using kulning techniques. This specific vocal technique draws influence from life on the fäbod (seasonal dwellings, similar to the Scottish shieling, usually located around mountains and forests), part of a Scandinavian Middle Ages farming system; kulning would be used by women of all ages as a herding technique. The vocal technique of kulning typically requires a woman's voice, as it reaches usually long, sustained high pitches, which are produced loud enough to project across pastures, for the function of herding livestock. It may, at times, sound melodically dramatic, as it uses half and quarter-tones and thus creates melodic tensions. In the context of *Omega 3*, there are some melodic patterns, but the timbre is really what interested me the most; this is why it often appears as a sustained pitch, such as the one heard at 15'30. Incidentally, at that moment in the piece, it is part of several layers, in which the resulting sustained sound is much more complex than only the sound of a human voice.

In many respects, this kind of vocal material seems to contrast the factory setting, with the former suggesting an open countryside wilderness, whilst the latter suggests an enclosed, man-made form of manufacturing. For this reason, the voice almost always appears far away, woven into the spatial mix, in a sort of dream-like effect. It is worth noting, however, that the original recordings were also heavily affected by the physical environment of the factory space; not only because of the space's acoustics, but also because Tuulikki used many of the factory's structures to make her voice resonate in the space.

Within this piece, the kannel, an instrument which is local to Estonia, served to create (or at the very least evoke) a cultural environment. For this reason, the instrument is rarely

[26] I will note here that even if the piece is performed over an array of loudspeakers, it is originally stereo. It was simply diffused over several loudspeakers in order for it to fill the space of the factory, which was considerably large.

performed solo, or playing melodies[27]. In fact, it is not recognisable until its first appearance at 10'45. At that moment, it is heard in the background, masked by the presence of a very active, powerful and compact stream in which there are several nervous, as in eventful, elements being heard. It is only at 10'48 that the kannel finally moves into the foreground, with its accentuated resonations. Here, instead of developing a melody, it triggers a small sequence of chords before suddenly being relegated again to the background by a much more abrasive sonic event at 11'. There is another brief kannel moment, at 11'11, before it is once more interrupted by an impulse which dominates the musical discourse from 11'17. Sounds of kannel strings are heard one minute later at 12'25, where they are barely distinguished from the environment already established. Indeed, their faint presence tends to easily blend in the mix, especially with the already sustained immersive vocal pitch, which occupies the same register. At 13'18, there are still hints of kannel chords, again without them being extremely prominent. During the 15th and 16th minutes, its presence is implied by subtle hints, with sounds echoing chord-plucking, such as the one barely heard at 14'40. It then reappears at 16'20, as an accompanying layer until the end, fading away toward 17'50, where the voice takes over and concludes.

By including sounds of the kannel in the piece, I attempted to appropriate its material for my own music making, being aware that it may easily create an almost anecdotal reference to its folkloric tradition. Instead of drawing attention to these obvious cultural references, I attempted to use these concrete, referential elements in a highly-personal, unconventional way. Of course, the original cultural environment is still present through certain recognisable cues (such as the timbre of the accordion, voice and kannel) but by using them in more unconventional ways, and by distorting their initial realities with electroacoustic processing techniques, I have aimed to make the sounds my own. This is in the sense that I have worked with obviously cultural material, and whilst cultural environment is central to my approach, I do not necessarily need to constantly observe it through a looking glass. Its presence may be affecting my composition without it having to be made obvious at every moment. In the end, however, there are still traces of cultural environment, and whilst *Omega 3* was composed entirely in Estonia, it is not said that the Estonian cultural environment was more important than my very own cultural environment (as in my own experiences as a composer).

The musical environment of *Omega 3* is the result of a mix of different cultural elements interacting with each other and creating different referential layers. Overall, this gives a surreal quality to the mix of sources, sometimes establishing contradicting images (i.e. open wilderness and closed factory spaces). With this section, I have attempted to identify sounds which have a highly cultural connotation by definition. The accordion, voice (used with kulning technique) and kannel all have roots in long musical traditions which, in the particular setting of Estonia, have shaped the use and sound of these instruments. Whilst they most undeniably have a physical reality and thus exist also within a physical environment, their cultural quality might be the most telling in terms of understanding the presence of cultural environment within *Omega 3*.

[27] I should add here that this was a personal æsthetic choice, in the sense that the cultural environment might have been evoked by the cultural nature of the kannel, which is typical to Estonia. In this particular instance, the manifestation of cultural environment happens largely through the use of many characteristic layers, such as the kannel and the previously mentioned kulning and accordion.

## 2.3 Exchanges Between Electroacoustic and Live Practices

As Tuulikki generally works with folk music, her practice rarely involves the use of musical scores. Instead, she use melodies and harmonies that are explored and developed through acts of improvisation, within a broadly flexible musical form. For this reason, when the time came to write the first version of the piece, we decided to have a loose musical form, with a fixed electroacoustic part. This influenced my writing style, because instead of immediately determining final form, I had to consider how interactions between recorded sounds and the live performer might work when using three different instruments. Eventually, we agreed it would be best if the electroacoustic part was not too dense, allowing the form to breathe whilst giving some moments of respite for Tuulikki, especially while she was improvising, she had to be mindful of her surroundings, and have time to switch between instruments. Often, she would decide on the instrument to use according to how the environment (as in performance environment) would react to the sounding of either the instrument or the electroacoustic part, or the two together. For instance, if the electroacoustic part would be at one of its loudest points, it would be questionable to use the airy sound of the bellows (such as the one heard at the opening of the piece). At times, we might also decide to make the voices interact or make room for a solo on either part. As a consequence, we adopted a longer form, in which musical ideas emerge gradually, and in which details would be added as stems of the main auditory streams. An example of this is the opening of the piece: in performance, Tuulikki started with just the wind sounds of her accordion; one of the faintest sounds that the instrument can produce. In order to let it grow, we also needed to have it follow a delta-like movement, horizontally rather than with impulses, which would interrupt its progression. That sound was then reintegrated in the electroacoustic part, which added more voices and thickened the expression of the wind with other elements which contained a significant part of complex noises and behaved in a similarly delta-like movement.

Most of the composition process involved the interaction between my proposed sounds, or sound moments, and her improvisations. As the medium of acousmatic music does not allow for very efficient real-time improvisation with complex sound processing and editing, I was most often the one bringing sonic ideas, developed mostly from our earlier explorations, for her to improvise 'with'. Understandably, there was an important role for listening in the composition process, similar to that which is common within a concrete acousmatic approach.

Eventually, we decided on a musical canvas which integrated five main parts, alternating between horizontally and vertically developed sections. For me, the canvas was a way to be able to have a definite (or fixed) electroacoustic part with which I could work in performance, and from which I would be able to diffuse the piece in concert alongside her performance. For her, that same canvas was an improvisation guide, and a way to know what to expect from the electroacoustic part without having to stick to too many precise events. Whilst the form in its original state has changed during the re-writing, some of its structural markers remain. For instance, the quiet opening and the gradual use of new sounds certainly remains. We go through several deltas until, at 6'06, a sudden and important break happens. Here, the sound is of a completely different nature and energy: it brings an aggressive high pitch with a noticeable rhythm pattern which was not found until then. This moment lasts for about a minute, until a calmer section reappears at 7'15. This is a trace of how the first form of the piece was devised: within that canvas, Tuulikki was aware that a quiet part would be going on for the first few minutes, and that there would be a sudden change after the sixth minute,

where there likely would be somewhat of an electroacoustic solo. When the more quiet part appears at 7'15, she would hear the opportunity to interact once more with the fixed electroacoustic part. Furthermore, after 8', the kulning voice is much more present, indicating that she might herself perform kulning live and interact with it. Obviously, as the canvas was used mostly as a guide for improvisation, it is not said that this action would be absolutely predictable. However, her musical choices were likely to be in response to what would be found in the electroacoustic part. Having discussed in this section how interacting with the performer influenced the initial form of the piece, I shall now go on to discuss the next step, which was to revisit it and make it entirely acousmatic.

## 2.4 Revisiting the Piece: Form and Structure Challenges

In light of what was mentioned above, I found myself engaging in a long project without any score that I could identify as my own composition. That is why, once the performance had taken place, I decided to harvest the various materials used within the performance in order to create an entirely acousmatic work.

During the rewriting process, I was confronted with various formal challenges: the canvas that was earlier established required interaction with a live performer, which I no longer had. This created obvious imbalances which, even if I tried to 'fill in' the lightest streams in the already written electroacoustic project, stood out because of their importance and prominence within the structure. Most often, it would be large, uneventful sections which were designed to make it easier for the performer to participate without being overloaded with musical information encoded in the electroacoustic part. Consequently, I had to rebalance the piece, so that its different sections would have more satisfying proportions. Whilst the piece still largely follows the original canvas ideas, such as the slowly developed introduction, for example, I have reworked its sections so that they would have more complexity, and thus hopefully, a more engaging quality. For example, the original blowing sound of the bellows at the very start of the piece were not integrated in the original, live performance version. In the acousmatic version, not only did I integrate them, but also used processed versions of that sound and layered them with other musical materials, such as the several sound objects heard at 2'40.

Another way in which I have attempted to rebalance the form is by making considerable structural changes, dividing up some moments and moving them around in time to find a way to balance them out. Some of these changes might be most recognisable in the second half of the piece, after the initial introduction of the accordion materials and before the first formal break at 6'06. For instance, there are several switches in types of materials used: at 8'32, then at 9', at 9'24, and so forth. Some of these materials were created specifically for the acousmatic version. Those materials added to the expressive evolution of the piece, in order to help sustain a constant renewal in the musical ideas, seeing as there was no longer a performer to interact with.

## 2.5 Performance Environment: From Site-Specific to Portable

In the live version of *Omega 3*, we chose to make full use of the performance space by placing the performer where the acousmatic part could not be placed; at the top of the factory's structures. The array of loudspeakers available for the performance was mostly installed on the ground floor along with the audience. There was a possibility for the audience to walk around the space, but the upper structures were out of reach. As Tuulikki was placed at the very top, it gave her performance a very diffuse character. Moreover, the audience could not

see her, which created an almost entirely acousmatic experience. The sound of her instruments, emanating from the top of the room, showered down to the ground floor and blended with the fixed medium in ways that might not have been possible if she had been located in the same space; such was the degree of reverberation achieved through this positioning of the performer. In this respect, the first version was not merely a live performance. It was also a site-specific performance.

Initially, it seemed as though it would be impossible to present the work elsewhere. However, the work was subsequently revisited and redesigned as an independent electroacoustic piece. At this stage, the outer environment of this piece (performing space) loses priority over its inner environment (musical content)[28]. Extracted from its initial performing environment, the piece still contains much of its original substance; since the first version was composed, from the outset, using electroacoustic music techniques, it contained numerous elements that appear purely acousmatic. Stripping it from its live performance aspect and bringing it back to a stereo format obviously affected its relation to the environment. As such, it shifted from environment-bound to environment-creating[29]. Indeed, in a standard acousmatic performance context, the environment will less affect the reality of the piece than the piece inhabits the environment. Of course, both can influence one another, especially when it has to do with perception (the performance of an acousmatic piece clearly will not give the same results in a cathedral and in a small rehearsal room). However, the standard acousmatic performance assumes that the piece to be performed exists on fixed medium and therefore its content depends very little on the performing space—that is exactly the reason why the piece is fixed on a medium in the first place. Consequently, *Omega 3* went from site-specific to portable in its acousmatic redesign.

## 2.6 Conclusion

*Omega 3* again explored the manifestations of physical and cultural environment. In this case, however, it considered how these notions of environment might occur in the case of site-specific live performance, and how they can also go from container to content. This is observed, for example, with the presence of recorded sound objects which are impressed by the quality of the environment in which they are taken. Ultimately, the initial version of the piece, which was performed in an environment, was revisited and rewritten into a self-contained environment. Where the site-specific quality of the work had an impact on the composition, the sounds that were drawn from that environment, in turn, became the entire content of the ultimate acousmatic version of the piece. In considering different stages of composition, and the different factors in the process, we continue to shed light on my practice and expose the intricate complexities of the notion of environment in electroacoustic music, and how its

[28] The distinction made here is essentially taken from Chion's concepts of internal and external space in electroacoustic music, such as described in the 1988 article: Chion, M. (1988). Les deux espaces de la musique concrète. Musiques et recherches, 1. This is not to be mistaken with Smalley's notions of internal and external space, which suggest that internal space would be within a sound object, and that external would be the environment of that object, within the composition. (Smalley, 1997)

[29] This distinction is made in regards to its original state as a site-specific composition and as a standalone acousmatic piece. As a site-specific composition, it is bound to the environment in which it is created. As a standalone acousmatic piece, it creates a new environment, with its own musical content. This environment is therefore portable, because encoded onto a fixed medium.

different manifestations might be approached. This will be further examined in the chapters that follow.

## 3. An Almost Abstract Experience

Composed in the Visby International Composer's Centre Studio Alpha[30], *An almost abstract experience* (11'11) is my first multichannel piece. Reaching out of my usual comfort zone, this piece contrasts with my previous works, both through the choice and use of sound materials, and the decision to employ a multichannel format. *An almost abstract experience* is inspired by serendipity and synchronicity while exploring the ideas of balance and divergence.

This chapter considers, for the first time within this portfolio, source material almost entirely of an instrumental nature, recorded in a studio, and how this affects the presence of environment in the music. It goes on to discuss the particularity of the 5.1 setup, which is unique in the case of *An almost abstract experience*, and the solutions found to work with it. It concludes with a discussion around the form of the piece and what the metaphorical qualities of the environment it expresses.

### 3.1 Context: A Residency in Visby

In the autumn of 2016, I was given eight weeks to realise a new piece at VICC's Studio Alpha. This studio, set up in 5.1, invited the challenge of working in multichannel and, since I had never composed in this format before, this was an ideal opportunity to explore the medium. Having just worked with Tuulikki, and being familiar with the kannel, I was quite surprised to see that one of the students from the school of composition[31] had a very similar instrument with him. The instrument turned out to be a Gotlandslyra; a local traditional instrument which is of very similar build: instead of having a full soundboard, it has an empty space behind the strings, much like a lyre in the classical Western sense. I immediately thought it could be a good starting point to explore the sounds of that instrument, seeing as in my previous piece, I had mostly used accordion sounds and explored less of the kannel. I then came in contact with the student and this initiated a fruitful exchange to an extent which I did not expect. Upon learning that I was planning on recording one of the students' instruments, many other Tonsättarskola students became rapidly interested in participating in recording sessions for my upcoming piece.

### 3.2 Sound Sources: Creative[32] Recordings

I was very excited by the opportunity to have students participate in my project, and invited them to improvise as much as they wanted, for as long as they wanted, with all of the instruments that inspire them. I recorded them using a stereo (A-B) setup in Studio Alpha's recording booth. Interestingly, this led to many different, highly original, recordings that had their very own character. For my purposes, this provided a wide breadth of varied sounds,

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[30] VICC (Visby International Composer's Centre)., (©2018). VICC. [Viewed 29 September 2018]. Available from : http://vicc.se

[31] Gotlands Tonsättarskola is a composition school which cohabits with VICC in the Tonsättares hus in Visby.

[32] The use of the term 'creative' here refers to the fact that I approach the recording step already as an opportunity to explore creative sound making. Instead of having predetermined ideas that I would impose on the students, I would more often guide them in a broad way, giving them keywords or even complete freedom of exploration.

enabling me to start the compositional process. Even so, the initial source recordings were later expanded when VICC invited me to a networking event in Stockholm. At this event, I had the pleasure of meeting the Stockholm Saxophone Quartet[33], who immediately offered to produce some recordings from their workspace. Their sounds were added to the composition, providing yet more diversity to the sound bank I had already gathered.

These various sounds that I had gathered, coming entirely from acoustic instruments, were not typical for my compositional practice and, as a consequence, I immediately felt a sense of abstraction from the music. Especially after having been heavily dealing with field recordings in several different environments, suddenly using strictly instrumental sounds, in a very acoustically controlled room, gave me much less of a sense of 'environmental trace' in these particular recordings. As I was not really dealing with musically unpredictable object recordings[34], it was much easier (than with field recordings, for example) to classify the sounds according to their musical properties, which did not often change within subsequent takes in recording. This made my editing process very methodical and unifying: there were many instances where I was able to use the same sound processes, to develop a very cohesive sound bank. The sound bank had a few subcategories, and as in my previous works, I started developing the music according to the characteristics of the sounds that I had captured, and the various ways in which they could establish points of contrast among the many different voices.

## 3.3 A Form Determined by Contrasts

Once the recording and material processing steps were completed, I began by creating musical segments, largely following the musical characteristics found in each sound object. This meant that, for instance, if two sounds had a similar sustained dynamic profile, it was more likely that I would try to musically associate them instead of keeping them separate. This is made apparent, for example in the first section of the piece, at 0'35, where several rhythmical layers are juxtaposed chiefly for their rhythmical quality. This approach is the one on which is based most of the segment-building for this piece. Consequently, before making definite decisions surrounding a global form, I found myself with several, very uniquely defined sections, distinct by their specific musical qualities, which were the result of the characteristically clear instrumental sounds, which kept their strong qualities even when processed.

This caused problems when trying to establish an overall form for the piece which was not, at least in the early stages of composition, easily unified. Musically and internally, events could be unusual and interesting, but sometimes lacked a sense of direction because they led to so many different and eclectic moments. In other words, because the different sections were so strongly distinct, aligning them one next to the other made the piece seem like it was going from one scene to the next, without any clear purpose.

The solution I found for this particular problem was to divide some of those sections into smaller parts, then redistributing these parts throughout the piece. In doing so, this created a more consistent blend of characteristics and helped in creating links between the different

[33] Stockholms Saxofonkvartett., (©2018). Stockholms Saxofonkvartett. [Viewed 29 September 2018]. Available from : http://www.saxofonkvartetten.se

[34] Here, I am mainly referring to the fact that objects recorded for electroacoustic music making are not exclusive to traditional instruments, and therefore are substantially more complex to describe and classify. The existence of Schæffer's typo-morphology underlines this point.

sections of the piece. However, the risk that comes with this approach is that it has the potential to annihilate the sense of diversity among the various materials. Consequently, in redistributing the smaller parts of the sections throughout the piece, I wanted to place them in a way that they would give coherence to the overall dynamic profile of the greater form. I did this, for instance, by using some of the dynamic imbalances created by the contrasts between the sections to keep the engaging quality of the piece. An example of this can be heard at 4'52, where, after a dynamically calm section is introduced with low amplitude sounds of voice, some of the rhythmical sounds already introduced in the first section reappear so as to create a dynamic contrast and create a sense of novelty, even if it is done with already heard materials. This approach was used throughout the larger formal scale of the piece, which will be further discussed in the next section of this chapter.

## 3.4 Form description

I have identified 6 units which comprise the larger scale form of the piece according to the prominent musical material found in each of these sections:

0'00 — 3'20: Intro;

3'20 — 4'00: Vocal 1;

4'00 — 6'00: Vocal 2;

6'00 — 9'05: Winds;

9'05 — 10'30: Spectral Opening;

10'30 — 11'11: Coda.

Whilst the first two segments contrast in terms of their dynamic profile (one is mostly energetic and spectrally full with high dynamic contours whereas the other is more intimate with one or two isolated voices and substantially lower dynamic contours), the third unit introduces a blend of materials; this announces what is explored in subsequent sections, and creates a bridge between the different phases of the musical journey. It starts off with very similar material to that of the second unit (vocals at low dynamic levels), and connects it with progressively diverging materials (wind instruments, which at first are introduced in lower dynamics and mainly in the same mostly horizontal evolution, and progressively move towards a more complex, densified fabric of auditory streams).

Starting in the sixth minute, the fourth unit retains some of the vocal sounds, but these have clearly transitioned towards a less stable, more fragmented, rhythmical structure that is further explored as more sounds from wind instruments are introduced. This leads to a major densification, and spectral opening, at unit 5, where the accumulation of rhythmical, complex mass and high dynamic sounds converge into one main progressive delta[35], which ultimately releases at 10'30. At this point a coda, consisting of resonances of the previous events and of

[35] The term 'delta' here is used in reference to the delta-like morphology progression found in the dynamic profile of these segments. Annette Vande Gorne (2017) dedicates an entire section of an article to the 'delta' morphology in Vande Gorne, A., (2017) Techniques d'écriture par montage. In: *Traité d'écriture sur support*. Ohain: Musiques & Recherches pp. 1-17.

recuperation of earlier vocal sounds, concludes the piece with a hint of an open space taken from a brief soundscape-like recording at the heart of Visby, near the cathedral.

The presence of two substantially contrasting units at the beginning of the piece allows for the introduction of a wide range of sound behaviours which are later on explored. Thus, the two first units introduced the two main aspects of what I was working with during the whole piece: spectral density with fragmented rhythms and intimate spaces, alongside slower and more restrained dynamic movements. In that sense, it almost resembles the sonata form, with obvious differences: Themes A and B exposed in units 1 and 2, a bridge incorporating elements of both in unit 3, a development in units 4 and 5 and a final coda in unit 6.

## 3.5 The Particularity of 5.1

Unlike the creation of a stereo piece, the 5.1 composition process implies a surrounding placement of the musical voices, or auditory streams. Unlike stereo works where panning only involves left and right, 5.1 complicates the process by allowing for much more elaborate three-dimensional trajectories, which require a lot more work to automate. We suddenly go from a sound placement which is essentially only possible between two channels to five plus the subwoofer. It therefore requires one to think of the sound not only on the left-right axis, but also on the front-back, being mindful of the center and its solo effects, and finding a reasonable balance between the front sides and the rear sides. The way I decided to do this was to listen to each track independently and, according to the sound (or musical voice) which was heard, determine a location in the room and the level of precision it came with. For example, a sound with a halo[36], or an obvious reverberating behaviour, would tend make me place it more diffuse between more than one loudspeaker (as is the case with the particularly damp voice sound arriving at 3'18), and sounds which would be more defined and crisp tended to have very precise locations, following spatial trajectories (such as the breath sounds at 5') similar to what I would achieve with a diffusion on a stereo setup. As a result of this, I had a project filled with very intricate movements and complex interactions between voices in space, as if diffusion was already decided. Unlike with stereo diffusion, where I would only have two channels to manage, every voice had its own very unique trajectory. This said, because the writing techniques I used were based on layering, similarly sounding sounds would have very similar trajectories, without always being at the same place at the same time. This was, for me, an obvious and logical choice, if only to preserve diversity in space. Essentially, working in 5.1 does make it more difficult than working in stereo because I am dealing with five (or six) channels instead of two, but in my particular case, as I most often deal with a large amount of stereo panning already encoded from the point of recording, this is not usually as critical of a step as with multiplied spatial axes within composition. Furthermore, as I often use layering within my compositions, sounds which have already a complex and often irregular panning create, almost by default, original panning effects, as there are unlimited possibilities of combinations of sounds. In the context of 5.1, this already encoded stereo panning obviously can be expanded to the surround environment and thus requires a considerable amount of attention.

[36] This term is used by Michel Chion (1982), in which he refers to a 'halo effect' produced by reverberation, which is (in his words) an extension of the sound, and creates an effect of a surrounding room. In: Chion, M. (1982). *La musique électroacoustique.* Paris: Presses univeristaires de France, p. 57.

Space is another aspect which is interesting to explore in a multichannel piece. From studio to concert hall, each gesture is amplified and stretched in space. The main difference between 5.1 and stereo in this context is that it is not easy to manage five completely independent channels in a hall with (for example) 32 loudspeakers: it is quite unlike thinking in pairs of loudspeakers which can act as anchors in a defined spatial evolution. With this multichannel piece, I thought in terms of dividing the space in groups of loudspeakers which would act as scenes rather than pairs, where the entire 5.1 (or at least 5) can be adapted according to the performance space it is in.

Having performed the piece in different venues, I had the opportunity to use different approaches. In systems with a larger number of channels, (in such a way that I had space to duplicate the 5.1 image), I tackled the space as a groups of scenes. In order to keep some coherence, I would either move the same groups together, or always have a predefined group of voices stable in the space. Also, since the 5.1 format has a surrounding quality, I avoided clear-cut and extreme trajectories, such as a very quick front-back or corner to corner. Similar gestures in height, however, were less problematic, as they do not impact the surround effect as much as a thinner, more focused (ex. front-back) movement. This led me to privilege large, slow movements more than I might with stereo pieces. Consequently, the diffusion itself was not as much of an articulate technique rather than a very attentive and careful listening in order to follow the music whilst constantly being aware of the space. The more voices are available, the more creative I can be in terms of my use of the space. This is due to the possibility of anchoring some voices in a particular space without having to go back to its resources to create novelty in performance. It also allows me to set groups and slowly make the fixed elements evolve to different scenes, in relation to the architecture of the performance environment and the sound images which can be built and modelled into an original space. This even allows me to focus my attention on specific aspects of the music, offsetting others (for example, the internal energies, the functional and formal events, or the timbral qualities of the sound, and so on).

### 3.6 An Almost Abstract Environment

In the case of *An Almost Abstract Experience*, the physical environment became very discreet, in large part because of the nature of the original recordings. This is the first piece of my portfolio in which there is almost no distinguishable presence of a surrounding physical environment, at least encoded directly in the sound recordings. The only recognisable element of physical environment is that of the city of Visby, which very briefly appears at 10'56 in the sound of cathedral bells; these are very much a part of the background, and are mostly used to support what is happening in the foreground while helping to create stability in the declining dynamics.

As is the case with any piece of music, a physical environment is created within its own content or form. Thus, even though soundscape-like qualities are not found in this piece, it does not lack internal architecture and this becomes environment-like as the piece develops. In the case of *An Almost Abstract Experience*, therefore, the environment is artificial, creating metaphoric symbols, and impressions of a dream-like reality or surreal events. In other words, I create environments, or evoke places, when placing sounds in space; however, those environments I create do not refer back to real places: rather I create surreal environments or places, which may sound familiar, in the same way that dream-like places feel familiar without in fact being

exactly real, whilst sometimes also being simply unrecognisable, ungraspable, shifting. This is made clear from the beginning of the piece: the very first unit establishes a variety of different sound materials, which are not immediately identifiable as referential, with the exception of the human voice and breath[38]. The breath, which opens the piece in an intimate, close-up setting, is quickly juxtaposed with much larger instrumental sounds. These instrumental sounds contrast the breath in terms of their wider dynamic range, fuller spectrum and, ultimately, the introduction of rhythmic patterns at 0'10. These new layers continue to develop, until the emergence of a plucked string at 0'23, which colours the unit until its end at 3'20. As a result, there is an effect of widening, or opening; the monophonic breath-like sound suggests a closed, localised physical space, whilst the more active, broader sounds, bringing with them multiple layers of auditory streams, suggest the arrival of a more substantial surrounding environment.

It is no coincidence that I refer to the surrounding aspect of this environment; the format which was used for this piece, 5.1, is referred to as *surround sound*, and it would seem therefore that this medium is more likely to encourage the environmental surround than its stereo counterpart. This said, I naturally tend to compose with layering techniques, and these are common to both my stereo works and *An Almost Abstract Experience*. A key difference, however, is the various ways that these layers were influenced by the 5.1 format. In this piece, I felt that each musical object was clearer, because it was isolated in its own channel. In previous pieces, such as *Éclats de Feux*, I was working with the layers in a limited range, encouraging me to direct the different elements inside larger formal gestures and structures, unified by their grouped agogic. In *An Almost Abstract Experience*, however, the different auditory streams could be a lot more independent from one another, and flow more fluidly from one state to the next without appearing to disturb much of the larger picture. I was therefore more interested in creating diverging layers in order to fill up the space that was now considerably extended (in the sense of having multiplied the possible axes along which the sound could be placed, and its therefore surrounding quality).

Since there are materials of different natures, the units have become energetically and formally different (as in they are built differently). As a consequence, the environment also changes throughout the piece. For instance, the second unit (3'20 — 4'00), which starts after the active and diverse introduction, presents a much more sparse environment, with seemingly only two elements at once: the plucked strings and the voice. While the sounds are at a low auditory level, they do not manifest in the same type of intimacy as the beginning. Here, they are dampened by reverberation, and their spectral qualities are blurred by a halo (see previous reference) effect, suggesting an effect of room. A second, female, voice appears toward the end of this unit (3'46), only to support the general effect of room or perspective. This environment, much different from the one found in the first unit, creates a stark contrast with the unit that has just passed, thus suggesting a new space – implying a change of environment, and therefore movement.

There is a good deal more ambiguity in the next unit, which spans from 4' to 6'. We are still dealing with far-sounding voices, but here the movements start to animate an otherwise slow-

[38] One may argue, with reason, that human voice and breath are indeed also part of the instrumental range. However, as human voice has the immediate potential to become extremely theatrical rapidly, I consider it to be easily associated with anecdotal qualities. It is also a much more direct and clear connection to the source of the sound.

paced segment. There is the sound of human breath traveling in the space in quick gestures, most often taking to the foreground before disappearing. Towards the end of the unit, these gestures are increasingly accompanied by more complex sounds and, eventually, pitch (such as the bell-like resonances heard in the background at 5'). At 5'20, this has evolved to the point where there are several musical lines, some rhythmical and some melodic. At 5'35, a clear rhythm takes over each stream and, accordingly, this reminds the listener of the first unit. The breath also becomes fragmented into rhythms.

Whilst the female voice remains until the end of the unit and beyond, its function is eventually changed in the next unit. Between 6' and 9'05, it is no longer the main point of focus, but a unifying element between every other musical layer. Indeed, as new auditory streams emerge, take form and increase the density of the phrase, the voice remains stable, even if not constantly heard. Whenever audible, however, the voice is at the centre of everything; it is no longer far-away or dreamlike. Rather, it becomes a reference point for everything else that is happening around it. In effect, an environment has been built around the voice, as can be most clearly heard at 6'43, where everything seemingly follows the voice's energetic profile.

This environment expands in the next unit (additional layers are added, spectrum is fuller, different rhythmical events are less synchronised until they are engulfed in a larger, more horizontal gesture starting at 9'30). Some rhythmical events continue, however, and even sometimes reclaim the foreground, such as the one at 9'45. Even so, they are much less densely organised than they were before 9'30 and express a converging energy in which their behaviour contributes to the larger dynamic profile more than to their internal activities. This leads to the coda and final unit at 10'30, where the musical layers eventually dissipate at 11', leaving a single voice conclude the piece.

The constant interplay between diverging energies (meditative moments and the referential material of the human voice) creates a tension between expressive ideas and surreal environments, or worlds. Human voices, integrated in the fabric of the piece, suggest an almost intangible quality to their presence. Combined with abstract and non-referential sounds, they create unexpected scenes, and therefore exhibit somewhat of an unreal quality. As a result, the entire piece is built upon a number of constructed environments which vacillate between abstract and poetic. These environments mostly rely on interactions between the different sonic elements and their expressivity stems from contrasts and spatial effects, such as reverberation, multiplicity of layers, and spectral profiles.

## 3.7 Conclusion

Through the discussion of *An Almost Abstract Experience*, I explored the artificial aspect of environments within my compositional practice, in the absence of soundscape-like recording. I considered how the 5.1 format plays into this construction and briefly considered how such a format might direct acousmatic composition and subsequent acts in performance. Instrumental sounds were the most prominent material within the piece, and we shall continue to discuss their role in acousmatic music when considering the next piece within the portfolio.

## 4. Exercitium arithmeticæ occultum nescientis se numerare animi

The title of this piece translates as: "an unconscious exercise in arithmetic in which the mind does not know it is counting"[39]. This description has been applied to the phenomenological experience of music[40]; the elusive quality of music appears to make it reach the unconscious, despite its physical manifestation in sound. This gave me the idea of an unconscious cerebral calculation that unravels a tension between the abstract, intuitively perceived, and the concrete, measurable material of sound. This, to me, evokes a reality, especially manifest through electroacoustic music, that I have always found fascinating: the idea that music is only really manifested as music through the format of sound, even though one may be able to conceive of it as an idea. With the acousmatic experience, not only does the music need to be written (or encoded) in order to be perceived, it can only be done in real-time.

In this particular piece, all of the material is derived from recordings of a saxophone quartet. Their sounds are transfigured, multiplied, layered, and ultimately combined to create a new sonic, surreal reality. This stereo acousmatic piece, composed between 2017 and 2018, started with a recording session of the Stockholm Saxophone Quartet. Having previously collaborated with them in the composition of *An Almost Abstract Experience*, I was interested in exploring further the interactions between instrumental sound recordings and electroacoustic composition methods. Given the quartet's pronounced interest for live performance, I decided to create a *musique mixte* piece, allowing for the possibility of live performance to follow in the future. The resulting piece can be performed as either an acousmatic work, or alongside the live saxophone quartet involving a fixed media part. This is explained by the fact that the composition was not made in two separate streams (i.e. score and fixed medium) but was first and foremost composed in a concrete manner, and the score was the result of the fixed medium.

This chapter shall go over the composition process of this piece, examine the presence of the anecdotal and theatrical elements and how they affect the form and observe the link between the live and the fixed versions of *Exercitium arithmeticæ occultum nescientis se numerare animi* (12'26). It shall go on to discuss the way that this piece was scored, and conclude with a reflection surrounding the potential for its different interpretations and multiple environments.

### 4.1 Composition Process

The composition process for this work was fairly similar to other pieces of this portfolio. Much like in the case of *An Almost Abstract Experience*, *Exercitium arithmeticæ occultum nescientis se numerare animi* started with a sound bank derived from instrumental improvisations. In this case, it was a much more unified sound bank, as the source of all the sounds that were captured originated from the saxophone quartet. In order to create the possibility of having a live performance, I decided to treat the sounds in a very specific way from the beginning; I have made an inventory of the original sounds that I recorded and kept them for direct

[39] Rasula, J. (2016). History of a Shiver: The Sublime Impudence of Modernism, Oxford University Press, p. 67.

[40] In fact, Rasula lists a considerable number of authors and thinkers exploring philosophical ideas associated with this Latin phrase, including: Leibniz, Schopenhauer, Bely, Valéry and Debussy, among others. Each of these philosophers have used concepts relating to consciousness and mathematics when describing music (idem).

(unprocessed) use in the composition. This allowed me to have a sort of 'audio score'[41] in parallel to the completely electroacoustic part.

Whilst I conducted familiar steps of my composition process, such as sound editing and processing, I was conscious that the transformed materials would be used alongside the unprocessed sounds. Eventually, I started to group sound materials and, gradually building up from isolated elements, I developed a number of musically complex segments. In a way very similar to the one used for *An Almost Abstract Experience*, the way that I grouped those sounds was by categorising them for their musical qualities. For example, pitched material would have its own category, whilst materials with a complex mass would be a different one. From these groupings[42], I eventually associated sounds from similar-sounding categories, and eventually created larger segments. It is with these segments that I started to have a sense of the more formally determined structure of the piece. At first, the elements of voice and laughter were not very important, even though they stood out due to their very dramatic, almost theatrical qualities. While those types of sounds can be tricky to use, largely due to their almost comical nature, I recognised their potential and thus decided to start exploring them.

The voice and laughter recordings turned out to be particularly useful in helping to determine a form for the piece; whilst they were not always exposed in their original form, they carried so much meaning that they became functional. In other words, these sounds naturally attract the listener's attention, and in doing so, they appear to be formally significant. Drawing from this, I decided to create very distinct events from these materials, which I treated as formally significant elements. Since they distinguish themselves so vividly and sharply, they are bound to create contrasts when placed alongside less referential material. From these contrasts, I identified moments which I then used as guides throughout the musical form. Thus, there is a sustained contrast between vocal and instrumental sounds, which creates certain formal markers and indicates a certain interplay between the two levels of style (purely musical and more theatrical).

The various ideas mentioned above ultimately guided me through the elaboration of the large-scale form of the piece, and kept my attention on the performative potential of the work beyond the purely acousmatic version. As the piece was composed in mostly the same way as the majority of my other electroacoustic compositions (essentially in a concrete manner), the workflow stayed essentially the same, except for the added step of the score at the end. As the instrumental part was being composed following the original, unprocessed sounds, I constantly had an idea of how it sounded. What was different in the process, this said, was that I was mindful in keeping a constant presence of unprocessed sounds throughout the piece, to ensure the presence of a musical layer that could be used for live performance by the quartet.

Whilst the piece is filled with environmental materials, such as large spectral events often built upon many auditory streams, there are constant reminders of the performers; either through direct placement of unprocessed vocal materials, or through sounds which, despite originating from from the voice or laughter elements, would be more processed and thus treated like a

[41] Here, I want to make clear that the score is not purely audio, but that the first step to scoring the piece was from the fixed medium. As the piece was thought out in a concrete manner, sounds were used as audio materials first; only later were they guides for a paper score. This shall be discussed in more detail in the Scoring Techniques section of this chapter.
[42] A visual reference can be found in the annex.

part of an environment. In this way, the piece communicates a notion of 'performative environment', which is subject to change at every performance; not only because of the space in which the piece might be heard, but also because of the optional presence of the performers, and by their interpretation of the score.

## 4.2 On the Anecdote

Unlike previous works, the referential or anecdotal[43] aspect of this piece is not in the sound object itself, or even the space in which it may have been recorded, but in the anecdote derived from the presence of human voice, which is often very theatrical and at times even comical[44]. By allowing those materials to have their very own presence amongst other complex materials, I created a sort of multiplicity of semantic levels. In doing so, I am creating at least three referential contexts: the first one with the unprocessed, possibly live, saxophone material; the second with all the derivative materials that originate from the saxophone recordings; the third with the vocal theatrical materials, which do not refer to the instrument, but to the performers.

The interaction between these three types of material creates something of a cultural environment within the piece, alongside an artificially created physical environment. In much the same way that it happens in *An Almost Abstract Experience*, here the physical environment is built up of many musical layers and interacting auditory streams. Some spaces may sound familiar because they are derived from a known musical material (i.e. the saxophone quartet), but are not actually real, such as it would be, for instance, if it were the soundscape recording of a saxophone quartet in a given physical space. The cultural aspect of this environment, once again, is the inextricable result of music as a cultural product. However, in this case, the way that the cultural information is transmitted and received is bound to be different, because of the presence of (particularly theatrical) human voice throughout the piece. If within *Omega 3* and *An Almost Abstract Experience*, there was the clear presence of a human voice, it was much more musicalised (as in primarily understood as musical lines) than in the case of *Exercitium arithmeticæ occultum nescientis se numerare animi*. Not because I did not intend, as the composer, to use the voice for musical purposes, but because it is so loaded with comical and theatrical qualities that it is only natural for the listener to read in it not only a musical component, but also human affect (in its psychological sense).

Whilst they are, in essence, different types of sound materials (unprocessed saxophone materials, derivative materials and vocal materials), they also tend to generate strong associations because of their very recognisable characteristics as source-bonded objects. The

[43] Concerning the nuance between 'referential' and 'anecdotal', I judge it relevant to make a precision. A 'referential' sound object refers to the perception of an external, known reality or idea, that has implications beyond its manifestation within music (the voice of the recorded performers being one such example, because it refers to their reality as 'vocal persons', which goes beyond their role as instrumentalists). An anecdotal sound object, however, tends to have more of an emotional content; without necessarily establishing a clear narrative, it refers to human affects (an example of this would be the performers' laughter, which, not only being voice, implies some form of emotion). This is why I preferred the use of the term 'anecdote' for this section's subheading.

[44] The human voice could here be taken as a sound object, but I would like to reflect on the fact that taken out of context, human voice phonemes, whilst still very referential, do not automatically create anecdotal music. In this context, however, laughter and obviously exaggerated theatricalities make this musical material, in my understanding, lean toward the anecdotal quality, in the recorded sounds from the beginning.

vocal, theatrical layer is the one which most easily catches our attention and, for this reason, it was chosen as a central figure, or guide, throughout the piece. Without wanting to give this vocal material an overwhelming prominence, I decided to see it as assuming structural function: it initiates the piece, then influences the internal energies (for instance, some laughter elements have an iterative quality to them that are replicated in rhythmical instrumental sounds, as can be heard at 0'20, and a little differently at 3'08). As is the case with the event at 3'19, they become useful for the orientation of the piece. Within their appearance, I joined more abstract material, in several layers, so as to create a sense of heaviness in the piece independently from the laughter material. This material was first there to guide, and not to retain one's attention for too long. The laughter materials are present until 3'40. However, they are not alone and are used in a more musical way (interacting with different auditory streams) than in a theatrical[45] way. For example, the laughter presented at 3'52 is immediately re-represented in an accelerated form at 3'54. While I am mindful that the theatrical element is likely to be ever-present, the musical aspect of this material can in this way be somewhat enhanced. By listening to the musical characteristics of the sound which can be manipulated (pitch, space, timbre, amplitude, rhythm) and taking them into account while processing the originals, I can thus focus on its musicality in a somewhat isolated manner, making the dramatic qualities of that sound less foregrounding.

The instrumentally sourced sound materials take on a much more energetic role within the piece: they fill in the structure, realise much of the gestural content of the work, and create an impression of space. This is particularly noticeable at around 4'10, where a saxophone recording emerges, widens in spectrum presence, and is supported by a low-pitched continuous rhythm, with elements of mid-high pitched and melodically evolving layers. When this part appears, there is almost instantly the creation of a new environment which follows the wind-sound agogic[46]. Another example of this is at 7'20, where the appearance of very obvious laughter moves into the foreground, only to be engulfed by the constant, rhythmical, layers of instrumental sounds that were already present.

The raw saxophone sounds mostly interact with, and complement, the instrumental and environmental sounding materials. Toward the end of the first minute (around 0'40), there is a very active group of wind-like materials, and there is a distinct interaction between those and the sounds of the live quartet. A way in which this is identifiable is how unified both layers are to each other. The electroacoustic part is obviously more processed, including elements of blended rhythms, filtering, and duplicating of musical lines. The 'live' part, however, is clearly set in its own spectral range, rarely straying beyond so that it sounds like a constant 'hiss'. This creates an impression of depth of field to the piece which otherwise would be potentially quite difficult to achieve.

## 4.3 Choosing Between Live and Fixed

As I mentioned earlier, recordings of the saxophone quartet were used throughout the entire piece. Considering that the work allows for the possibility of live performance, I had to develop

[45] When I say that the materials are 'not theatrical', I mean that they are used for their sonic qualities and musical potential rather than for their dramatic qualities. They are really considered as musical voices/layers within the composition process before they are at all considered for having a dramatic potential.

[46] The use of the word 'agogic' here refers to the internal energies of the music or the sound being heard, which have an inherent directionality.

a method of composition which would generate a fixed acousmatic piece, and a fixed-medium 'part' that might be accompanied by the quartet in performance. This was achieved by approaching the potentially live musical materials in exactly the same way as I would the electroacoustic elements; both were developed in recorded form, within the composition studio. In this way, the writing process became quite organic in that it was not hindered by a doubled writing process, as it would be in the case of having a score written in parallel to the fixed-medium part. In this case, it was fully integrated at every step of the compositional process. The unprocessed sounds were simply added to the streams as I would add any other processed sound, and they therefore interact in a more seamless way. As a result, this allows me to have the entire project in one sequence, and to perform it in a purely acousmatic way if required. It also becomes relatively simple to extract and bounce only the live saxophone part in order to subsequently notate it for future performance. This method is further discussed in the next section of this chapter.

## 4.4 Scoring Techniques

As we have just seen, the score takes its origins in the audio composition directly. For reference, I have joined screenshots[47] of the project as it was in the DAW. The top three (Audio-1, Audio-2, Audio-3 of the 'Overview' figure) tracks of the composition were reserved for the unprocessed, original saxophone recordings. At the end of the composition of the piece, these three tracks were bounced separately in order to have an audio file which would be a reference for the score to write. The particularity of this score is that many of the recorded original sounds were the result of an improvisation session with the saxophone quartet. The outcome of this is that many of the sounds created during that session were highly original and often made use of extended techniques for the instruments. Moreover, at all times were the members of the quartet improvising all together, so I approached the quartet more as an instrument, rather than separating each voice. Another reason for treating it like this is that most of the sounds which are found in the unprocessed part of the composition can be reproduced by any of the four instruments. Another point to consider was that as the recordings themselves, as well as the composition, usually have a broad quality (as in suggesting large masses rather than delicate and precise counterpoint), I did not feel the need for exact timings (except for two moments, and still, they are optional), as long as the quartet would be able to follow the broader contours of each musical gesture.

Having all of those observations in mind, I began by referring myself to the audio bounce of the unprocessed sounds. As, like I mentioned earlier, I was approaching the quartet as one instrument, I felt no need to differentiate the different saxophones, so I made one score grouping all of them together. Although, by default, all four are written in the left margin, it is mostly for reference. At no point is there any intervention reserved for one instrument only. Furthermore, as the sounds to be written were so unconventional, they would have been needlessly complicated to notate on regular staffed paper, so I resorted to use labels. As I did not need much precision in the interpretation of those interventions (and, I might add, the tone of the piece, derived in large part from laughter, suggests, at least in my eyes, room for freedom and flexibility), I placed a representation of those sounds throughout a score divided by the minute. Those interventions are mostly represented by labels, except at certain points, where I judged that basic symbols might help (amongst other things to represent style or as an

[47] Found in folders included on memory stick.

interpretation guide). Many of these labels may not, at first, be easy to understand at first sight (for instance, 'gagging into instrument' at the end of the second minute, or even 'difficult laughter (as if out of breath)' at the end of the fourth minute). However, I do not believe notating them in any other way could have been more helpful. Therefore, I have concluded that one should at least listen to the audio bounce material taken for the score and its integration in the entire piece before attempting to interpret it, in order to really understand what is asked of the performers. The paper score is more of a detailed guide for live improvisation with the piece than an exact list of instructions for musical interpretation. I do believe that if one has heard the acousmatic composition, one may have a good idea of the type of interventions which would be compatible with the piece. Furthermore, the unprocessed sounds are so characteristic that I am confident they are easy to memorise and, therefore, reproduce.

In summary, as the paper score was derived from the audio part of the unprocessed sound composition, it could be said that the 'full score' requires both knowledge of the audio version and of the paper version. This said, the paper version was written mostly to lighten possible logistical needs: it is much easier and arguably more natural to improvise alongside a fixed medium by loosely following labels on a paper score used for reference than it is following a live, in-ear recording of one part of the composition, whilst the other part is also heard at the same time, in the same room, with loudspeakers possibly surrounding the performers.

## 4.5 Multiplicity of Environments

As we have seen, *Exercitium arithmeticæ occultum nescientis se numerare animi* has the potential to exist in multiple forms. The first one, acousmatic, stereo, standalone and self-contained, within which all musical voices are present, and which can be performed in an entirely acousmatic way, on a regular diffusion system. The second, which adds multiples, is the possibility of having a live saxophone quartet improvising (following a detailed guide or loose score) alongside a fixed medium. Here, every iteration is bound to be, even if ever so slightly, different, and create a new version of the piece. Consequently, according to the performance experienced, environments are likely to be different.

At this stage, having not had the chance to have the piece performed with the quartet so far, I can only reflect based on my experience of having performed it in an acousmatic way. As the general style of this piece is to use, most often, large masses of sound, it tends to fill the performance hall easily, not having many directional sound materials. However, directional sound materials are what add to the precision of the piece. With this version, what I found difficult in diffusion performance was to achieve a level of contrast between more intimate moments and more engulfing musical gestures. As the intimate moments are rare in this piece (placed alongside drone-like materials), they proved especially difficult to isolate. This can make for a considerably uniform environment. For this reason, without saying that the acousmatic performance of this piece cannot be successful (rather than being wary of its challenges), I am very curious to hear a performance of the piece with the presence of the live saxophone quartet. I do suspect that, their instruments being made by design to project directionally, the piece and its physical environment (both the performed environment, as in the piece itself, and performance environment) would benefit from the presence of the live quartet. I would imagine that there would be an effect of increased perspective, and an added level of engagement, not only for the presence of the performers, who likely would be theatrical in their own interpretation, but also for the fact that the overall performance

environment would be composed of sounds of multiple sources, and the more uniform part of the piece (i.e. fixed sounds), which would be performed through loudspeakers, could serve to support the quartet's performance, rather than having to fill the hall by itself.

## 4.6 Conclusion

Throughout this chapter, we have examined the particularity of *Exercitium arithmeticæ occultum nescientis se numerare animi*, and how it exists in both the acousmatic format and the *musique mixte* format. We have observed its composition process, and how the presence of anecdotal and theatrical sounds have affected its form. We then went on to study its scoring techniques and how the score may be a guide for the performers, before concluding on the potential for multiple physical environments, especially in the performance of the piece. With the next chapter of this thesis, we shall further discuss the possibility of multiplicity of environments, especially regarding its internal (composed) environment and external (performed) environment, and how it interacts in a very unique way with its listeners.

## 5. Border Crossing

Composed for a LARP (Live-Action Role Playing game)[48] in December 2017, this stereo acousmatic piece (10'10) is designed to evoke an emotional[49] environment more than a physical one, in-so-far as it implies an *inward* sense of environment. More specifically, different levels of environment are present in this piece:

1- (on the *internal* space[50] level) constructed metaphorical (emotional) place;
2- field recordings and non-referential sounds within composition;
3- (on the *external* space[53] level) performance space;
4- gaming environment.

This chapter will explore the meaning behind, and implications of, these four levels of environment, and consider how this affects the listener's role within gameplay. In doing so, we shall see how the use of constructed cultural environments create a loose narrative, and how the physical environment affects listener-participation. Finally, we shall connect the musical content with the surrounding cultural environment unique to this LARP and briefly explore some of the results of this.

This particular LARP[54] requires the participants (which constitute the main audience for this piece) to partake in the simulated journey of a refugee, leaving their country with urgency, in a desperate attempt to reach a safer land. For the purposes of this event, the *border crossing* is represented by a ten-minute interpretation of road transportation, where the performance space is essentially a relatively small and closed black box in which the audience is seated. As this space is quite limited, a simple stereo setup was used for diffusion of the piece.

I wish to make clear here that it is not expected for this piece or even this gaming setup to only ever make do with a stereo setup. However, given the organisation's means, it was rather unlikely that they would have a more elaborate performance system. It should be noted, also, that LARPs do not usually incorporate such musical components in their events. LARP events are very often organised with limited resources, and their main focus is to organise a functioning, large-scale game in which dozens, if not hundreds of players take on roles to emulate a fictional social setting. Consequently, sound and music are rarely seen, and even more rarely enjoy elaborate logistical support. However, as a composer of electroacoustic music, outside of this context, I do believe that *Border Crossing* can stand alone as a piece, and I would treat its performance like any other acousmatic work: from stereo, according to the

[48] Tychsen, A. et al. (2006). Live Action Role-Playing Games: Control, Communication, Storytelling, and MMORPG Similarities. Games and Culture, 1(3), pp.252–275. (Tychsen, Hitchens, Brolund, & Kavakli, 2006)
[49] I am aware that these concepts may exist in social and psychology studies. However, as my main area of study is music, I do not wish to go deep into the definition of 'emotional environment', outside of approaching it from the metaphorical, æsthetic level. The theme given for this composition was an emotional state of distress, mixed with ideas of fear and hope, inside the encompassing situation of a major transition through travel. This is what I have used as inspiration for musical expressivity in *Border Crossing*.
[50] Such as Chion describes it.
[53] Idem.
[54] Its first iteration was executed successfully in London in December 2017, then once more as part of a larger event, *The Quota*, in Oakham, in May 2018.

space and system it is performed with, I would address its presence in the environment, and make interpretation decisions accordingly.

## 5.1 Implications of LARP format

In the spirit of *live-action role playing*, the audience in this particular case is not merely a passive receptor of the music. Rather, the audience is actively engaged, in the moment, with the sonic information provided by the piece. In other words, this is not a typical acousmatic music performance: whilst the setup is technically acousmatic, its functional use affects the larger game's narrative. Indeed, *Border Crossing* is one part of a game devised in several steps. Within this LARP game, the participants are required to take on characteristics according to the role that they are given. For instance, in the context of *Border Crossing*, we are dealing with a fictional situation in which several participants are migrants attempting to become refugees in the UK. Within those participants alone, there might be single mothers, couples, specific professionals, and so on. They interact with one another and with other types of characters who may not be migrants (i.e. UK locals). This creates a complex game dynamic and ongoing narrative, which is constantly determined by the participants' choices. As such, *Border Crossing* was composed to support, highlight and direct the likely state of mind of those fictional migrants, who have no information on their journey other than that they are being taken from one point to the next by road. During that step, it is therefore only the audio content of *Border Crossing*, which is performed until they move on to the next part of the game. Consequently, compositional choices served to generate a musical environment, immersive[55] not necessarily only by its acoustic physicality, but first and foremost by its psychological effect in the context of a game. Indeed, this piece can act as applied music and therefore is designed to set the mood for a scene in which the characters are in a form of high emotional stress and uncertainty. In this context, it is possible that both the listener and the character personified by this listener each have their personal reception of the music, because they obviously represent different cultural environments: any listener can receive this piece in any given context outside of a LARP event and understand it as a typical acousmatic piece, making their own cultural readings. With the added context of the LARP, the character, placed in a situation in which *Border Crossing* is their main source of information, which can affect their own survival, is bound to have a much different cultural response than the first type of listener.

## 5.2 Internal Space: Field Recordings, Synthesis & Place

As previously mentioned, I have identified four levels of environment which can be useful in further understanding *Border Crossing*. In order to be able to differentiate them in a simple manner, I have categorised the first two as being part of the internal (composed) space, and the remaining two as part of the external (performed) space. Whilst I know that these different environments may interact and overlap, this allows me to isolate them and discuss the ideas which surround them. We shall start by briefly exploring the ideas of a metaphorical or emotional environment.

[55] With the use of the word 'immersive', here I am not referring to a surround sound setup, rather than the environmental experience of the performance of the piece in the context of the LARP.

### 5.2.1 Metaphorical (Emotional) Environment Or Place

Before I go into the specifics of the composition itself, I would like to take a look at a bit of text by Bijan Zelli, on the subject of imagination, taken from his 2010 article *Musique Acousmatique and Imaginary Spaces*:

> Musique acousmatique is a good example of the application of defamiliarized sounds in order to provide a virtual sound atmosphere in which "the listener's aural imagination can be drawn into personal, psychological realms quite different from other musics" (Smalley 1991, 21). The idea is based on human capabilities that interpret unreal sound structures arbitrarily and connect real and virtual worlds.[56]

This reflection by Zelli, which is partly based on Smalley's words, highlights the strong evocative powers of the electroacoustic medium, through the experience of the listener. Just as I have previously discussed, given the listener's cultural environment and their personal experience, they will inevitably and "arbitrarily connect real and virtual worlds". They will make the experience of acousmatic music their own. Moreover, in essence, the "sound atmosphere" is a sound environment. When, in the text above, Smalley refers to "personal, psychological realms", he refers to what I have previously identified as *emotional environments*. This type of environment is what I would identify as part of the internal space of the music (i.e. what is contained in the composition). It is the content of the music that expresses the metaphorical, emotional[57] environment. It is the sounds that it contains that are evocative for the listener and that, ultimately, communicate this emotional or psychological meaning. There may also emerge a sense of place for the listener, where, in much the same way that in *An Almost Abstract Experience*, there would be the possible reference to surreal, dream-like environments and ideas of place, which, just like dreams, are ungraspable and shifting. The occurrence of place, in this context, is thus in relation to the personal way that the listener connects to this constructed metaphorical space. The challenge when discussing this level of environment is that it is, by definition, a very subjective one. It is, thus, of course very difficult to predict the reaction of a listener, or even to pretend to know beforehand what the content of the music will, in fact, communicate. However, this is where I resort to referential materials taken from field recordings, which become part of the internal physical environment of this piece.

### 5.2.2 Field Recordings and Non-Referential Sounds Within Composition

Without referring back to a known physical environment, referential, source-bonded materials taken from field recordings depict elements of physical environments which are relatively common, such as a van door (0'00), a vehicle's running motor (0'15), a waterfront (7'25), and passing road traffic (1'18), for instance. Those sounds consequently serve to give referential cues to the listener in order to remind them of the figurative journey that they are on. Another type of sound that I use to support this discourse is non-referential or synthetically generated sounds. Whilst not immediately referring to a known tangible object, they are often used for

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[56] Zelli, B., (2010) Musique Acousmatique and Imaginary Spaces [online]. Bijan Zelli. [Viewed 2 October 2018] Available from: https://econtact.ca/13_3/zelli_acousmatique.html

[57] I might make the precision here that whilst 'metaphorical' and 'emotional' are not exactly the same thing, they are on the same environment level. In this context, 'metaphorical' refers to the fact that the environment is suggested by the sounds used in the composition, whilst 'emotional' is the result of the listener's reading and understanding of that metaphorical environment, and their own relationship to it.

their function within the music (i.e. a broad delta-like dynamic gesture like the one heard between 0'20 and 0'30 will refer to road traffic). In effect, this occupies the internal physical environment of the piece. It should be noted here that it is because of the presence of the musical content (so, in effect, the sounds themselves) that the metaphorical, or emotional, environment can exist. This is the main reason for which the two types of environment are bound to overlap and interact with each other. Whilst the physical reality, at least at the internal space level, of the composition is fixed and therefore will not be altered during performance, the emotional environment is subject to shifts and evolution throughout the performance of the piece, and even from one performance to the next.

In order to depict a "border crossing", I decided to rely upon original sound recordings which would be anchors for the main narrative. As this is meant to be evocative of a road journey, I loosely set the figurative space in a van with recordings of the initial van door opening and closing (0' — 0'05). This is the signal that the participants are about to embark upon a road journey. Moreover, this sound returns at the very end to signify the clear conclusion of the journey and, consequently, the piece itself. Simultaneously, a synthetically generated sound is heard from the very start. I conceived this synthetic sound, starting quite stable and low-pitched, much in the manner of a vehicle's running motor, as being the basic metaphor of the road journey. This said, its percussive entrance, and growling quality, is suggestive of a stressful journey, thus serving to establish a sense of tension from the outset.

With the closing of the door (0'05), I added a higher-pitched sound which contributes to the sense of tension, and further enhances the complexity of the musical environment. Following this, the layers become more numerous, with the emergence of a nervous foregrounding rhythmical pattern, being energetically supported by a noisy delta-like sound, from which a synthetic pitch emerges (0'20). This type of sound will be mostly present throughout (although it may change in pitch or in source, such as the event at 1'18) and is used as a sort of symbol of urgency. By 0'22, sounds of an engine start to be clearly defined as an anchoring sound object by its recognisable source-bonded reference: the participant is being reminded that the journey is in fact happening on the road.

Around 0'40, the musical text is even more complex, this time with sounds echoing the passing of traffic (almost no pitch with high complexity, passing by quickly both on the left and right channels). These sounds reoccur at several moments during the piece (for example 1'47, 2'08, 3' and so on) and their purpose is always to keep the participant anchored in the simulated reality. As such, the environment within the musical piece is manifested in two main forms: one anchored in source-bonded, recognisable sound recordings and the other constructed by synthetic, non-referential material. Whilst many source-bonded sounds have a clear purpose of communicating a narrative to the listener, they do not depict a known environment. This is where the idea of place, again, becomes useful in understanding *Border Crossing*. As we saw with Norman and Dyrssen in the first chapters and as I have discussed above, the notion of place is an ongoing, personal process which is not only derived from suggestive metaphors created by the musical content, but is also affected by the personal experience of the listener.

That is to say that as much as my music contributes to a form of scenography as part of the LARP event it is performed in, it does not provide rigid information on the evoked physical environment experienced throughout the piece, such as soundmarks for example. In that sense, anyone who is on the receiving end of the musical work will not be forced into

identifying specific environments: the journey remains personalised even with the presence of recognisable elements, such as running engines and road traffic. As a result, the musical environment in which the listeners find themselves serves to establish a strong feeling of evolving place. This is underlined by the other, more constant musical stream (composed of synthetic sounds), which is of long-haul progression and which has its own developing agogic throughout the piece. As such, we could say that the audio stream composed of synthetic sounds has a more horizontal behaviour and outline the greater form of the piece, and the sounds originating from source-bonded recordings are usually punctual events, which, in their vertical behaviour, shape the greater form at localised moments in the music.

Whilst I did choose to use recognisable materials as a constant reminder of the road journey, I intended to create correspondences between the two different types of sounds (i.e. source-bonded and non-referential). Consequently, the synthetic sounds often have an agogic which follows the experience of a road journey and the source-bonded materials do not clash with the synthetic sounds; rather they emphasize tensions and take on functional roles (such as initiating or concluding a phrase, for example). Furthermore, there is one instance where the sound recordings take on a more poetic role. For example, at 7'23 where from the complex sounds emerges a recording of the seaside. That moment in the piece is not especially logical in the context of a road journey experienced from the inside of a van, and in that particular moment, I wanted to express the wanderings of a mind. Whilst synthetic sounds were employed, from the start, to determine the metaphorical and symbolic environment, the experienced construction of an imaginary place would become vividly concrete in the space of a few seconds between 7'23 and 7'55, where a character may have the distorted memory of a waterfront, lost in some daydreaming of the moment. It could be worth noting that this moment also appears as the resolution of tension which had been previously building from 4'44. This tension was building for nearly three minutes with the intensifying of dynamics in the long delta created by the thickening of the synthesis sounds, by very gradually adding more complex elements with interacting rhythms and raising their dynamic levels in the otherwise nearly unchanging voices. The very end of the piece has an analogous conclusion, although starting with rather more pronounced tension. Here, the music is also accompanied by the processed sound of a siren, whilst an aggressive synthetic sound emerges at 9'46, with an irregular melodic profile, taking over most of the foreground. The tensions are finally only resolved when the final van door sound is heard.

Ultimately, as much as these constructed environments are present within the musical piece, they are also experienced in a particular space and context which is distinct from most acousmatic music diffusion occurrences. In the next section of this chapter, we shall discuss the external space of *Border Crossing*, and how it contributes to further understanding the piece.

## 5.3 External Space: Performance Space & Gaming Environment

In the context of this specific LARP, the participants are guided into getting on-board a metaphorical van, which is a narrow, closed, dark space. This has consequences on the experience of the musical piece; unlike other works in this portfolio, intended to be performed in large concert halls with loudspeaker arrays, this piece requires (at least in the context of the LARP) a small, intimate space.

### 5.3.1 Performance Environment

The intimate, and potentially stressful, performance environment required for a presentation of this piece is designed to direct the listener towards their own, inward sense of environment; the idea is that the listener will actively construct their own experience of their own character as part of the gaming narrative. In regards to the format of the piece, having composed it in stereo certainly helped to make it easy to perform over modest systems such as the one the LARP team had, without having to compromise anything in the composition itself. About the format, Zelli says this:

> The great advantage of the stereo technique lies in its flexibility and suitability for many performance spaces.[58]

He then goes on to cite Vande Gorne:

> Annette Vande Gorne portrays musique acousmatique as "*cadrages, profondeurs de champs, mouvements fictifs*" and considers this music as "*composition avec l'illusion de perception de l'espace*" […] She concludes that stereo is well suited for musique acousmatique, as it can reliably fulfill these tasks. […] In addition, stereophony works for Vande Gorne as a small instrument that supplies a large number of services: "*On peut alors constater combien, avec une très grande économie de moyens, les espaces virtuels conduisent et font résonner l'imaginaire*…"[59]

He also warns about adding excessive distance from the loudspeakers:

> In a stereophonic listening situation, the listener must stay fixed at a point of equal distance from the loudspeakers in order to perceive an accurate spatial impression. When the listener moves to more extreme positions, the spatial illusion is greatly weakened.[60]

In the first part of this quote, this supports the idea that, even in a performance setting, stereo has the ability to convey the musical contents of electroacoustic music in a convincing manner. Stereophony is flexible, having the potential to contain clear musical environments, and creating illusions of perspective, allowing the composition to shift focus and create "fictive movements" within those environments, as suggested by Vande Gorne.

On the question of the specific effect on the room itself on the sound, Henriksen describes the essential acoustic factors which may influence the experience of the music according to the room in which it is heard:

> When listening in a room, the sound pattern reaching the ear is always different from that emitted from the source. The listening environment acts upon the sound in different ways, resulting in variations in spectral, temporal and spatial distribution. The acoustic influence of the room is always present to a greater or lesser extent, and is a factor that the composer must bear in mind when composing works for public performance. The acoustic influence varies with different rooms, and can therefore not be thought of as an absolute entity in the composition

[58] Zelli, B. (2010) Musique Acousmatique and Imaginary Spaces [online]. Bijan Zelli. [Viewed 2 October 2018] Available from: https://econtact.ca/13_3/zelli_acousmatique.html
[59] Idem. (The French parts read as: "framings, perspective, fictive movements" … "composition with illusion of the perception of space" … "We can thus notice how, with a great economy of means, the virtual spaces drive the imaginary and make it resonate…".)
[60] Idem.

> process unless the work is to be created for a specific, known listening space. Even then the acoustic conditions are likely to vary with the size of the audience, and the performance of the work must be carried out accordingly.[61]

Those are questions which were of course considered in the particular case of *Border Crossing*. The setting of hearing an acousmatic piece in a small black box is quite different from that of a typical concert hall. However, as Vande Gorne implied, stereo can also be adapted to different performance spaces and setups, which brings me to an important question to be addressed: Is there an ideal performance environment for *Border Crossing*? Ultimately, the answer to this question lies in the context of its performance. As this piece was conceived to be part of a narrative support for a LARP, the limited space of the black box is where it was planned to be performed initially. In such a restricted space, a stereo setup is not likely to compromise the content of the music excessively. If one imagines the black box as having similar dimensions to those of a van, it is reasonable to conclude that the "spatial illusion" (or representation of the physical environment) is still preserved to an acceptable degree. I would not expect this performance space to allow for "more extreme positions" for listening. This said, taken outside of the context of the LARP, this piece may very well be performed on a more traditional acousmatic performance setup (i.e. occupying a large concert hall with many loudspeakers, of which the number can vary). In such a context, "more extreme positions" are much more likely, and the setup is therefore hopefully adjusted to the room, in an effort to keep the spatial image accurate to listeners in various points of the hall. Is *Border Crossing* better suited for one space or the other? I would like to believe not, otherwise it would imply that either, it is only truly validated through the very isolated event of this specific LARP, or, on the contrary, that it would fail to hold its function within the LARP and it would, by default, need a more traditional acousmatic performance setup. As I have already received comments from the LARP organisers that the piece was successful in feeding into the particular narrative of the game and that it indeed did contribute to the participants' gameplay, I can safely say that its performance was, in fact, appropriate in the context. This said, in an acousmatic music context, there is no need for such a specific narrative, at least not in the way that the LARP is designed for. Consequently, in an acousmatic context outside of the LARP, I would most probably want to make sure that the overall form and musical content are accurately conveyed, and would decide on a performance manner that would, for instance, highlight its gestures and enhance its physical environment. Now that we have discussed the performance environment of *Border Crossing*, we shall explore the last level of environment, found in the external space of the piece: gaming environment. This is the context in which *Border Crossing* is received, and is the result of a cultural environment.

### 5.3.2 Gaming Environment

The added layer of the gaming context certainly affects the listener's experience. As players embody the characters of refugees, they certainly have a predetermined mind-set which goes beyond the simple reception of the music in its physical, acoustic environment. Interestingly, there is a constructed cultural environment relating to those listeners: not only do they have their own, personal reaction to, and understanding of, the presented music, but they should also embody the thoughts, emotions and actions of their assigned character. This implies that

[61] Henriksen, F.E. (2002). Space in Electroacoustic Music: Composition, Performance and Perception of Musical Space. London: City University, p. 72.

as the music is part of the scenography of this LARP, it is therefore functional and not simply received as a regular performance. There are thus two levels of cultural reception in each participant: the æsthetic appreciation of the work and its interpretation in order to inform the character's response in the context of that particular road journey. Consequently, the second layer of constructed cultural environment becomes a sort of text which bears meaning in the greater context of the game. As a result, the greater form of this piece has a major influence on the gameplay of the participants. This said, there were no specific theatrical instructions from *The Quota* project's team, so the composition was not made to suggest a particular path or give precise information on what would happen during that road journey. Nevertheless, comments I have received from the game designers were that the music seemed to carry a noticeable amount of convincing suggestion of emotion and effective tension build-ups, as some participants in fact reacted quite vividly to the performance; some being physically startled and others screaming in fright. Having now discussed all previously identified levels of environment for *Border Crossing*, we shall examine its form more in detail, how it came to be and how it conveys the narrative of that road journey.

## 5.4 Form & Narrative

In order to understand the formal construct and narrative of *Border Crossing*, I have divided it up into seven segments, following the dynamic contours of the piece:

1. 0'00 — 1'20: Departure
2. 1'20 — 3'00: Road 1
3. 3'00 — 4'20: Tension build-up 1
4. 4'20 — 6'00: Inward
5. 6'00 — 7'25: Tension build-up 2
6. 7'25 — 8'30: Road 2
7. 8'30 — 10'10: Resolution

As mentioned earlier, this piece is constructed mainly from field recordings and non-referential sounds. In this case, as the main focus was the function of this piece within the LARP context, the presence of cultural environment in the case of this piece is, as discussed above, manifested in the context of the gaming environment and the temporary community built around the event. As such, *Border Crossing* was designed first and foremost to build a certain (even if fluid and loose) narrative. The narrative is that of a fictional road journey, which unfolds over the course of the ten minutes of the piece. It expresses itself, at the start, with an information-rich setting, in an effort to create the impression of a sudden immersion into a completely unique world. Toward the centre of the narrative progression, there is then more of an 'introspective', or 'inward' segment, in which an emotional environment is expressed. This central part then progressively leads up to a final tension build-up, over the length of three segments, until the final resolution, symbolising arrival. In this instance, unlike with *Éclats de Feux*, the specific provenance of the field recordings were not the primary source of meaning. In this case, their function, ultimately, are the formal guides for this piece. In other words, both main types of sounds (i.e. source-bonded and non-referential) respectively serve to give narrative cues and support the musical and dynamic development of the piece. The source-bonded sounds were identified earlier as a van door (0'00), a vehicle's running motor (0'15), a waterfront (7'25), and passing road traffic (1'18). The non-referential sounds (mostly

sounds of synthesis), on the other hand, are less clearly differentiated, because they have less of a known reality to refer back to.

When observing the successive placement of the segments throughout this piece, one can come to the conclusion that the greater form is roughly following an arch shape: it is largely symmetrical (except for a variation at the end, which concludes in a dynamic tension build-up and final release), with the different build-ups echoing each other, on either side of a central, more intimate segment, which I have named 'inward' for this reason.

If the narrative of this piece is first announced by the sound of a van door, the rest of the elements placed early in the first segment serve to set the tone for the piece. For instance, juxtaposed to the van door sound is a low frequency pulsating synthesis material which is initiated from the start and which lasts for most of the first segment, holding its position in the background. This sound is there to support the musical discourse and to add a layer of symbolic reference to the journey on the road: this low-frequency pulsating material presents qualities which can suggest a running motor, thus providing another musical way to evoke the road. Other sounds, as mentioned earlier, also serve to support the musical discourse, to enhance its dynamic profiles, and, at times, to thicken the musical lines (most commonly, it is to help with the tension build-ups, especially the ones found in segments 3 and 5). Those sounds are found throughout the piece. In segment 1, they occupy a broad part of the spectrum: from the low, pulsating tone to the higher pitched delta-like motions (0'20) and the mid-high rhythmical pattern starting at 0'06, there are many layers filling in the musical lines, often moving to and from the foreground. Consequently, segment 1 establishes the start of the journey with an abundance of sonic information, within a rapidly complex physical environment. With regards to the narrative, in composing like this, my intention was to rapidly set an environment in which the listener enters, and also to indicate a sense of urgency, and, with the abundance of information, to symbolise active movement. As it is symbolic and ultimately purely æsthetic, it may be read in several ways, again according to the listener's background. Nevertheless, the main idea behind this musical choice was to convey a symbolic road journey.

The second and the sixth segments are similarly built, in the sense that they both are significantly based on external referential cues. Whilst this type of cue can be found throughout the piece, for instance the van door and the running motor in the first segment, here, the focus is on clear elements of the road. Segment 2 starts with sirens in the background at 1'20, then goes on to develop not only on the running motor sound at 1'30, but also gives way to, for a very substantial part, sounds of passing road traffic starting at 1'34. These sounds will punctuate and occupy most of the foreground for the entire segment until the shift in auditory streams at the turn of the segment, at 3'00. With these sounds, in relation to the narrative, I support the idea that the journey is in motion. Segment 6, on the other hand, is perhaps more complex in the sense that without so much referring to passing road traffic, has clear references to some external place. The presence of sounds of water from the start at 7'25 establishes an outdoor scene, followed by sounds of machinery at 7'40, and a clear human presence with the voices at 7'45 serve to establish a certain sense of place. Without many obvious cues on exactly *which* place this might, be, though, it remains an unknown place, most probably imaginary.

On either side of the central part of the piece, we have segment 3 and 5, which both have a dynamic tension build-up taking up most of their duration. In the case of segment 3, we are leaving segment 2 at 3'00, and thus also leaving behind the source-bonded sounds of passing traffic to enter a purely abstract scene, in which most of the sounds are synthetically generated. Here, dynamic gestures similar to that of the passing road traffic are kept, only reproduced with complex, grainy high-mid sounds, which act as a symbolic reminder of the sounds of road traffic. On the narrative plan, this was, for me, a way to express that we are leaving the referential experience of the road and going toward a more inward experience of the character, reaching toward a mostly emotional environment. From the start of the segment, a new, complex, but pitched sound is introduced and stays steady until a low-frequency complex mass appears and grows in dynamics, at the same time as a lower-pitched sound gains more amplitude at 3'20. At this point, more layers of nervous sounds are added (high-pitched, grainy sounds as well as a rhythmical complex mass) and serve to build up dynamic tension. Most of these layers fade away after 3'44 to give way for more steady, low-frequency auditory streams. Those are leading up to the central part, at 4'20, which has a much more intimate sound world.

Mirroring this, segment 5 has a tension build-up from the onset at 6'00, starting with a rhythmical pattern in the lower frequencies, rapidly expanding toward a higher pitch, and introducing a new, grainier sound with a rhythmical pattern at 6'20. Following that new rhythmical pattern, the dynamic intensity of the segment is extended every time it is repeated. This is done by the use of a supporting additional complex mass sound, heard more in the foreground accompanying the repetition of the higher pitched rhythm. By 6'40, a shift occurs with the apparition of a steadier, smoother high pitch largely present in the background, but supported by a complex mass which will take over the foreground progressively, especially after 6'57, where the new pitch is made more prominent. The sounds of complex mass evolve into a white noise, which then turns into the previously mentioned field recording of a waterfront, at around 7'20, where a final event, (a quick machinery hiss) finally intervenes and breaks the tension. In effect, in a narrative gesture opposite to that of segment 3, with the development of segment 5, we went from a rather intimate segment, built with fewer sounds and lower dynamics, to a broader image, a scene in which clear referential sound objects are presented, narratively leaving the emotional environment to go into a more active and complex physical environment.

The central segment of *Border Crossing* is where, narratively, I placed the most intimate environment of the piece. Having gone through the first three segments, by that point, the listener has had time to settle in to this symbolic road journey's sound world, and as a composer, I have imagined it to be a favorable moment to dive into a more internal experience of the road. Thus, as we leave segment 3 and enter segment 4 at 4'20, most of the auditory streams fade away, to leave two low-pitched rhythmical sounds at 4'30, where a complex mass remains. This mass also fades away completely by 4'48. At this point, the low pitched rhythmical patterns are accompanied by a steady mid-high pitch, and this is a moment that lasts until 5'20. In a very slow progression, layers start to enter: an oscillating pitch emerges at 5'20, and this goes on until 5'30. At 5'30, a new low-pitch rhythmical pattern emerges, and lasts until a final shift happens at 5'55. Here, a new pitched sound is introduced, and will lead to the next, more active segment at 6'00. As we can see, segment 4 is the segment in which the transitions are the slowest. Added to the fact that the dynamics are overall considerably lower than in the rest of the piece, this is a way for me to express a more meditative state, a state of

introspection. Following the loose narrative of the piece, this is a part where the physical environment leads to a more emotional environment.

Finally, the last segment of this piece, segment 7, starts at 8'30, after an information-rich segment in which there were several referential sounds, referring to a sense of unknown place. Here, lower frequency rhythms are very present and emphasise the sense of a stressful situation: they are assertive, take up the whole sound image and can make the listener trapped in this repetitive rhythmical cycle. Adding even more stressful elements to this, a high, rhythmical pitch, reminiscent of a siren, enters at 8'45, only to be joined and ultimately masked by another high pitched, harsh material which follows slower glissandi. By 9'04, the dynamic levels of the entire environment are increased, and the lower frequency rhythmical sounds are again in the foreground, enhanced by a very salient, complex mass, taking up most of the middle section of the spectrum. The two siren-like high pitched materials return clearly at 9'10, and this scene densifies until the final release at 10'00, where the sound of the sliding van door indicates that the journey is over.

In summary, with the use of several segments built following different dynamic profiles, I have expressed the narrative of a symbolic road journey, at times using source-bonded sounds to provide cues, and at other times making use of non-referential sounds to support the musical discourse, and also to explore emotional environments related to the central ideas of urgency and travel.

### 5.5 Conclusion

Having explored the different levels of environment in this piece, we also briefly re-examined the significance of place in relation to constructed musical environments in the context of gaming narratives. We have also observed how environmental sound recordings inform meaning and greater form whilst synthetic sounds create a more metaphorical environment. We have explored the significance of the very specific context of performance of such a piece and briefly studied the context of this collaboration ultimately impacting the participants and discussed the form of the piece at length.

It would be interesting to further investigate the implications of such collaborations and explore to which extent music can be applied in such contexts. *Border Crossing* turned out to be an atypical setting for composition, as *The Quota* was meant as an educative experience on the current immigration and refugee issues experienced widely in Europe. The idea of using acousmatic music to help inform on certain social issues with the use of cultural environment is certainly worth investigating further in later projects.

## 6. Résistance

*Résistance* (10'15) is a stereo acousmatic composition realised in 2018, incorporating partial recordings of my grandmother, Nives Massera, in which she recounts her experience sharing a dance with Django Reinhardt, and participating in the French Resistance. In this piece, therefore, the compositional exploration of environment was very much cultural and symbolic, even though its writing style, like the other works presented in this portfolio, involved complex layering techniques which create unique sonic environments. Having previously worked with folk music artist Tuulikki Bartosik in the project of *Omega 3*, I decided to use recordings of her

accordion as a symbol of history and traditions. In the same line of thought, I used recordings of a Buchla[62], which also holds a historical quality, especially on the electronic music scene. These two main materials emerge and interact with the recordings of my grandmother's voice, creating sonic environments anchored in the general theme of memories and history.

This chapter shall examine the presence of cultural and historical artefacts and how they relate to environment in electroacoustic. It shall explore the relationship with personal and cultural content, and how the cultural environment informs the product. Finally, it shall examine the materiality of the original sound sources as a comment on its cultural environment.

## 6.1 Cultural Environment: Memories and History

*Résistance* is the only piece within this portfolio of original compositions that contains spoken words. Given their ability to provide an unambiguous reference to historic moments or events, I became interested in the possibilities that memories could inspire musically. In this case, I had a personal connection with the recorded voice, and the recounted memories, even though neither were my own. Whilst the primary aim of this project was to create a work of art, questions of documentation and cultural traces arose during composition. I will briefly explore these questions with the help of literature surrounding new media and documentation.

Similar to the auto-ethnographer, when composing this piece, I consciously blended different levels of context. Such levels of context can include, but are not limited to, personal experiences, cultural references, references to history, and personal memories. I should make a note, here, that I do not believe it is in fact possible to definitely identify every single context which concerns the artist, author or auto-ethnographer as there can be a multitude, who overlap, interact, influence each other, and are possibly even unknown to the artist. This is why, for the purpose of this chapter, I have chosen to focus more specifically on the ones named above. Having said this, those contexts certainly connect to the previously defined and explored notions of cultural environment, and as such, we shall examine their manifestation within *Résistance*. As mentioned earlier, cultural environment, however perceived or encoded, is infinitely complex and contains several layers, which are read with equally infinitely varying understandings by the receivers of its content. In Jacek Smolicki's words,

> […] auto-ethnography does not happen in seclusion from external contexts. It is not a reflection written from the perspective of an isolated entity, but rather from the perspective of a conscious subject who recognizes its complex links to an entanglement in wider social and cultural contexts of which the auto-ethnographer's reader is also a participant.[63]

As should be clear, *Résistance* is not a document of my own life. This said, much of the composition work I do incorporates traces and artefacts of my immediate surrounding environments, both physically and culturally. Consequently, I generally document them in one form or another. That is to say, for instance, if I produce field recordings, they are bound to be a form of documentation of the physical and cultural environments I am in and interact with at the moment of producing said recordings. In the case of *Résistance*, cultural artefacts, produced as the result of recording my grandmother's voice, were the starting point of the

[62] A modular synthesiser system which emerged in the 1960s and of which a well-preserved relic is accessible at the world-known EMS (Elektronmusikstudion) studios in Stockholm.
[63] Smolicki, J. (2017). Para-Archives: Rethinking Personal Archiving Practices in the Times of Capture Culture, Malmö, Malmö University Press, p. 161.

composition, chosen precisely because they were clearly identified cultural artefacts and only secondly because they were potential musical materials. On the notion of recording and artefacts, John Cousins gives us a relevant observation, worth quoting at length:

> A recording is always a recording, whether it be visual, aural or both. It is an artefact. An objectified experience, a record of an experience. Although perceiving the object involves experiencing it in the 'now' (as a series of moment by moment present events) the content of that series of moments is, by definition, second-hand; rendered sounds or images from some past actuality. I believe this encourages us to respond to any recorded artefact with a fundamentally nostalgic attitude. This response impacts our awareness of our own mortality and as such, carries deep emotive implications. The recording is an embodiment of moments from the past that can only be recaptured in this objectified form. However, this very nostalgia works as a positive discriminator. It encourages us to ignore the fact that this is an artefact and to embrace it 'as if it were a present actuality.'[64]

Thus, according to this author, not only is the recorded artefact a witness of the past, it is also a powerful link with the past, often triggering responses like nostalgia. It is this 'nostalgic attitude' which inspired my approach in *Résistance*. As Cousins describes, it is possible, and likely, that one would look at the artefact as a form of present. Thus, when composing this piece, I placed myself in the situation of the receiver and the creator simultaneously. As I was listening through the recording of my grandmother's voice, I was also deliberately choosing moments which would give a starting point for the piece and, as I progressed in the composition, came to place these artefacts[65] in the musical text itself, as musical elements. Whilst it is the nostalgic attitude which brought me to create this piece of music, I do not necessarily wish to trigger it in the listener of *Résistance*. As the recordings were taken in a very personal manner and in an environment which is directly related to me as an individual, I am more informed than most on the content of these recordings. In that sense, I might be biased and react more emotionally to this material than most people. However, the medium of music is after all a means of expression, and I would, of course, regard it as a positive result if the listener manages to connect with this very personal aspect of my life. Again, as Smolicki highlights,

> Auto-ethnographers do not protect the readers from becoming emotionally involved in the case at hand (Muncey, 2005), but expose them to a "patchwork of feelings, experiences, emotions, and behaviors that portray a more complete view of life" (Wall 2008, p. 10). But perhaps what is most important is that the added value of the auto-ethnographer's work is above all his/her ability "to connect the personal to the cultural" (Ellis and Bochner, 2000, p. 739).[66]

As such, in making an æsthetic and musical use of my grandmother's voice, I do not aim to make it purely musical, nor do I wish to avoid this connection between the personal and

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[64] Cousins, J. (2010). The Nuts and Bolts of Multichannel Work [online]. John Cousins. [Viewed 9 June 2018]. Available from: http://www.studio174-nz.com/nuts-and-bolts.html

[65] In this chapter, I frequently use the term 'artefact' to refer to the idea of the trace of a cultural environment, documented here by the recording. The reason it is reserved to this chapter is that the approach to the composition of *Résistance* is markedly affected by a sort of nostalgia and fascination for this trace of a culture, which relates back to a community which is partly foreign to me, partly home to my grandmother. Furthermore, 'artefact' is the term that Cousins himself uses to describe this type of approach.

[66] Smolicki, J. (2017). Para-Archives: Rethinking Personal Archiving Practices in the Times of Capture Culture, Malmö, Malmö University Press, p. 161.

cultural with the use of acousmatic music. It is also for this reason that I chose not to excessively alter the original recordings of her voice. This is a case where there are, indeed, audible, spoken words, which can be decoded and clearly understood. However, as much as this was the starting point for my composition, it is not the only musical component. In that sense, it is a very similar approach to that of Steve Reich's *Different Trains*[67].

Rather than simply documenting, I deliberately chose to omit part of the text that the voice was recounting. In a similar way to Steve Reich in *Different Trains*, I use short excerpts, in which only a few words are heard at a time (0'20, 0'36, 0'50, and so on). In several moments, the phrases are cut, and sometimes repeated (1'12, 1'18, 1'27, 3'07 and so on). As much as these words are text for me, they are not intended to be received in the same way. In other words, the original story that she is recounting is not necessarily important for the listener. In the same line of thought, I do not expect every potential listener to know and understand the French language in order to have access to the content of my music. Furthermore, these recordings describe two separate historic events: the dance with Django, and a perspective of the French Resistance. These two separate stories are intertwined, following each other closely and, at one point, even superimposed upon each other (4'24). As such, they do not construct much of an intelligible story. My approach, here, was to use them as impressions. Much like human memory, they offer mere fragments of a larger picture.

This composition uses a symbolic poetry, in which nostalgia, memory and cultural environment collide. These different carriers of information are represented by the different musical elements heard throughout the piece. The environment is created and manifested by the presence of many layers acting as a form of counterpoint. It recalls the context and cultural environment whilst being the manifestation of a physical environment by its material reality. The human memory, fragmented, is tainted by emotion, and most clearly depicted by my grandmother's voice. Indeed, with her voice are inevitably recorded emotions, her accent, her language, her perspective. As a clear point of contrast, are musical materials generated by the Buchla and accordion. These two sound types of sounds are heard throughout the piece and, whilst the human voice contains the original information, they elaborate two entirely distinct layers of text. Obviously, they do not distinguish themselves in the way that the human voice does, with its much more immediately referential quality. This was also a deliberate choice: I was illustrating my perspective of focusing on a story whilst being conscious of a complex context surrounding it.

Here, the accordion is still recognisable, although heavily processed in some instances (at 1'34, for example, it is distorted to the point where it becomes noise, making it very similar to the synthetic Buchla materials heard at the same time). I chose to keep it recognisable because, for me, it represented the idea of past centuries and, likely, those to follow. In this sense, the use of accordion is somewhat of an implied comment on the role of music as a universal language, capable of witnessing much larger spans of history than any one single human individual. Similarly, its text is not as precise as that of a human voice. As a component of cultural environment, it is present throughout without always standing out. This is analogous to the reality of culture itself: it is inevitably and incessantly present within every individual, without necessary being imminently identifiable.

[67] Reich, S., (1988). *Different Trains / Electric Counterpoint* [CD]. New York: Nonesuch

Similarly, the Buchla offers an even more distanced voice (or auditory stream) in the landscape of *Résistance*. At times in the background, mainly supporting the text, (0'30, 2'37), and at others so much in the foreground that it nearly eclipses other auditory streams (7'20, 7'33), it has a large dynamic and expressive range. Ironically, this could be considered the least *human* of the musical lines featured in this piece. Unlike the human voice or the accordion, it is not directly controlled by bodily, organic movements. Its modes of function are understood in rather abstract ways; it is electrical pathways inside the instrument which affect the result of the sound ultimately heard through a sound system capable of decoding its signals. Furthermore, having emerged in the 1960s, its sounds have a typical signature, reminiscent of that time. Thus, in a fashion near to that of the accordion, it offers a commentary on larger spans of history. Unlike the accordion, however, it represents a noticeably newer period in musical history; I used the Buchla as a representation of man-made systems in an industrialised society. Thus, just as my grandmother narrates memories of having danced with Django Reinhardt and taken part in the French Resistance, the accordion acts as the witness of countless dances throughout history and the Buchla poetically emulates the sounding alarms and abstracted mechanical systems which were found during twentieth century wars.

In this section, we have considered how the cultural artefact conveys an element of history and of memory. In the next section, we will see how the recorded artefact can also affect and become part of a musical style.

## 6.2 Materiality as Environment: From Artefact to Style

As much as an artefact is a trace of a cultural environment, and by extension a witness of history, it also is a witness of the media onto which this history is recorded. Usually, when I use recorded sound sources as musical material, I like to control the quality of the recording using the best possible tools. In the case of the voice recordings used to compose *Résistance*, the context was somewhat different. Indeed, it was not a planned meeting in which I would have been able to control the surroundings and create an ideal recording setup. This recording was a rather spontaneous one; my grandmother, being in a good state of mind, started recalling these stories and relating them. Standard industry quality recording devices were not available on the spot and a mobile telephone was therefore used to record her voice. Furthermore, I had not initially decided to record that event for compositional purposes and had those recordings with me for nearly two years before deciding that they could be interesting musical materials.

Understandably, given what is said above, the recordings were of a relatively poor sound quality; they were clear enough to allow for an understanding of human speech, but too compressed to be manipulated without serious sound processing artefacts (on a purely technical, sonic level) appearing in the file. The recordings themselves have other quality limitations, the most salient being distortion in the voice (an example of which can be heard at 3'38). Even with the presence of this artefact, however, the speech still has appreciable quality which makes the text readable. Thus, much in the way that the voice recordings in *Different Trains* refer to their own materiality with the background preamplifier noise of the original tape recording technology, recordings of my grandmother's voice expose the materiality of mobile phone recording in the 21st century.

Instead of letting this hinder my composition, I decided to be inspired by these artefacts and to make stylistic choices with them in mind. Consequently, distortion is not only heard in the

human voice, but in other sound objects: consider, for example, the accordion mentioned above, being distorted at 1'34. From the Buchla sounds, I decided to use noisy and complex material, which not only echo distortion in both the human voice and in the accordion, but also remind us of its electrical nature. In this way, the Buchla also echoes its own materiality with its generated sounds. Thus, in a comparable fashion to film documentary where the camera is hand-held, and the frames are not always controlled, some of the original sound recordings are the result of uncontrolled circumstances and bear witness to their own materiality. This, in turn, informs the privileged composing style for the piece, and affects the resulting musical environment. As a result of this, the initial physical environment containing the materiality of the artefact creates references to the cultural environment surrounding the creation of that same artefact.

## 6.3 Conclusion

Having explored similar qualities to documentation in this musical project, we have observed how an artefact of a moment in time may connect to different types of cultural environment and how human voice may guide our relationship to history and memory. We have also seen how an artefact not only is a witness of a point in time, but also of its own materiality and how this informs the musical style of the piece. As much as distortion and noise were used as a referential point for style in this piece, we will see in the next chapter how an overabundance of information is voluntarily created in order to achieve noise and create an intricate mesh of environments.

## 7. Avalanche

Like *Exercitium arithmeticæ occultum nescientis se numerare animi*, *Avalanche* (23') is a piece which includes both instrumental (percussion, here performed by Colin Frank[68]) and electroacoustic materials. However, in this case, the construction was not exclusively started with sounds that have their source solely within the featured instruments. Instead, many materials were taken from field recordings and soundwalks, thus inevitably including much more environmental information from the start, as was the case with *Éclats de Feux* and *Omega 3*. Whilst *Éclats de Feux* involved an exploration of places and *Omega 3* situated the accordion in a specific spatial context, here, *Avalanche* multiplies contexts (i.e. varying physical and cultural environments) to the point where they become nearly unrecognisable. Consequently, the manifestation of environment in this piece is through field recordings, an abundance of musical layers, and the interaction between the performer and their environment (in this case, sound and physical objects surrounding them). This chapter will explore the construction of *Avalanche*, the æsthetics surrounding it, the compositional approach, and how it came to be notated for live percussion.

### 7.1 A Multi-Layered Form

The composition started once I had accumulated a considerable number of field recordings and soundwalks in a number of different places that I had visited. Gathering the different materials in one project was, for me as an artist, like the effect of an avalanche. It felt like the unravelling of possibly a year's experiences around Europe and North America, including the memories, sometimes vividly tainted by emotions, which would surface all in one determined container. It felt like all of a sudden, there was too much to process, too much to render, and almost like the personal experience I had gathered along those many months was drowned in the rapid overflow of information caused by this sonic abundance. This is how the title *Avalanche* came to be. This theme of information overflow thus followed through the writing of the different musical segments and broadly guided my æsthetic decisions for this project.

The composition was designed to include the intervention of live percussion and, as a consequence, part of the challenge was to integrate instrumental thinking in the overall musical form. Consequently, in a similar way to the process of composition used in *Exercitium arithmeticæ occultum nescientis se numerare animi*, I pre-recorded sounds of percussion instruments which were selected among a traditional instrumental array and a more eclectic one. The inclusion of eclectic instruments (in this case trowel, steel brushes, tiles, paper, ceramic pestle and mortar, plastic scrap) was an idea that Colin suggested in the beginning of the collaboration, explaining that as a performer, he is interested in using unconventional instrumental objects. Later on, during the process of composition, as ideas surrounding the general theme of avalanche emerged, it made æsthetic sense to keep those objects. Many of those non-traditional instruments were found objects, common and considered of low value, which consequently can be likened to trash, scrap, and unnecessary clutter.

This led me to look at another aspect of environment in music, discussed later in the chapter. In this case, whilst information overflow is an æsthetic theme in the composition of this piece,

[68] Percussionist, performer and collaborator for this project. He is currently doing performance studies at the University of Huddersfield. For further information, one may visit his profile at this link:
Canadian Music Centre., (2018). *Colin Frank*. [Viewed 4 October 2018]. Available from: https://www.musiccentre.ca/node/131498

it also became apparent that it could easily be a part of the environment not only represented musically, but also physically during performance.

Following the general theme of avalanche, the idea for this work was subsequently to expose a very condensed number of sound objects in a short time span (the first two minutes of a twenty-three-minute work), then explore more specifically selected materials through a journey in several *tableaux*. The larger form may therefore be described as having 11 main segments, focusing on either field recording based or instrumental based sound objects:

1. 0'00 — 2'20: Intro 1
2. 2'20 — 3'54: Emerging Soundwalk 1
3. 3'54 — 4'48: Intro 2
4. 4'48 — 10'03: Emerging Soundwalk 2
5. 10'03 — 11'01: Tableau 1 Scrapes
6. 11'01 — 12'12: Tableau 2 Bamboo
7. 12'12 — 15'31: Tableau 3 Cymbals
8. 15'31 — 16'58: Tableau 4 Brushes
9. 16'58 —19'30: Tableau 5 Tiles
10. 19'30 — 21'35: Tableau 6 Ceramic
11. 21'35 — 23'05: Tableau 7 Bells, Conclusion

The result of this was an abrupt opening with no musical preparation for the sonic load presented, followed by a stark contrast leading to a musical scene in which an effect of silence is much more present (segments named Soundwalks 1 and 2). Following this, the segments 5 through to 11 involve an unfolding of the sound materials and energies presented in the first part of the piece (especially Intro 1 and 2). For example, the 'scrapes' objects heard in Tableau 1 are already heard, albeit relatively faintly in relation to the rest of the spectrum, in Intro 1 at 0'05. At 0'35, bamboo sounds are intertwined with the spinning of a bicycle wheel. However, the idea was not necessarily to only extract exact sound materials from the intro more than establish parallels from the sound energies (as in dynamic and timbral profiles) initially heard.

Some sound objects, such as cymbals, only start to appear in the second half of the piece. Still following the general idea of unfolding from the already heard dynamic profiles, however, many of these newly exposed sounds (cymbals, brushes, tiles, bells), are likened to previously exposed dynamic profiles by means of connecting them to several field recordings. Examples of this can be scrapes and bamboo being placed in such a way that they echo or interact with field city recordings containing sounds of skateboard (10'56-11'02) and a bicycle wheel turning (11'18). Whilst cymbals first appear as a novel sound, they are nonetheless introduced gradually, being likened to scrapes as can be heard at 11'30, where the two voices interact with similar material. As the tableau progresses, more cymbal materials are exposed and by 12'12, the musical construction has fully moved on to feature mainly cymbals, although scrapes, bamboo and field recordings are still present.

The Cymbals segment is distinct in that it behaves in an independent manner for a longer period than others. When the cymbal sound material has become completely solo, at 13'03, it builds its own temporary poetic environment. For two minutes, it is only with materials

generated from the cymbal sound object that a scene is formed[69]. This introduces a new musical moment which is connected to the original materials by way of association. Consequently, the Cymbals segment opens up to a completely new musical idea, echoing previously exposed environments without using sounds of the same nature. It reconnects at 15'04, where a sustained complex sound is superposed to a sustained city hum in a field recording which ultimately becomes undoubtedly recognisable at 15'14, when a skateboard is being heard represented in the original urban acoustics.

The following segments connect to the underlying field recordings reacting to internal agogics more than to the timbre found in these source-bound sound materials. It has the result of creating a scene in which an environment previously exposed is recognisable without being immediately identifiable. For instance, in the Brushes segment between 15'48 and 16'12, brush sounds interact with broad skating gestures by echoing the extended gestures. The blending of these two layers creates a new, intermediate environment.

The Tiles segment is introduced by means of a new field recording. As the Brushes segment nears its end, it starts to follow a new, broader agogic, which goes in deltas (16'44 to 16'58). By then, tile sound objects are already introduced and at 17'34, a sea field recording starts to be revealed. The tiles essentially interact with it for the duration of the segment, following slow deltas and moving between foreground and background, exchanging those roles with the sea field recording. Finally, during the Bells segment, a field recording of a train station makes itself clear with a distinct announcement at 22'16, and ultimately outlasts the bells, becoming the concluding environment.

There is a relentless character to this piece, which has few calm moments and a nearly constant stream of nervous sound objects bringing new materials or gestures, creating perpetually evolving environments. This is largely due to the sheer quantity of materials used for the composition, leading to the idea of avalanche as a theme. As a result of this, questions of information overflow and noise pollution were explored.

## 7.2 Information Overflow as an Underlying Æsthetic

Throughout the work, environmental qualities of the various sound materials are distorted by means of saturation. Unlike soundscape artists, who might be interested in lowering noise pollution, this piece purposefully seeks oversaturation. In this respect, there is an interesting distinction between the composition processes of Murray Schafer and Luc Ferrari:

> Murray Schafer […] conducted soundscape experiments where there was the least amount of noise pollution […] As for me, what I'm trying to render audible is the city or the country with the tractors, the traffic, the background noise of phone lines, the people on the sidewalk, the music coming out of the open doors of shops—everything that makes up our urban or rural environment.[70]

In this interview, Ferrari underlines the difference between soundscape as it came to be in the tradition of Murray Schafer, which identifies certain sounds as noise pollution, and therefore seeks to avoid them. In contrast to this, Ferrari is interested in the sonic portrait of the

[69] In this particular chapter, I use the term 'scene', rather than 'space' or 'place', simply because the piece has been conceived with the performer in mind, and the theatricality of his performance evokes a certain scenic quality to the piece, even in the context where the piece would be performed in a solely acousmatic manner.

[70] Luc Ferrari in Caux, J. Almost Nothing with Luc Ferrari, Errant Bodies Press, Berlin, 2012, p. 109.

landscape around him as a composer. He does not argue that one environment has more value than another. Rather that the environment informs the listener on where they are, acoustically and culturally. This approach is one I identify with. As an artist and a composer, I am interested in, and inspired by, the sonic world that surrounds me. Everything therefore holds the potential as musical material. Moreover, whilst I do communicate artistic ideas, I do not seek to make my music the instrument of a political message. This said, Ferrari has also been referred to as a soundscape artist in the context of wanting to provide the image of a sonic landscape. As earlier mentioned, I do not claim to be or even wish to be a soundscape artist. Where our two approaches differ is that whilst Ferrari puts an effort into rendering audible original recorded landscape, I do not actively seek to make it audible. Indeed, I am inspired by the environments where I find myself and continuously collect recordings which contain the traces of these environments. However, the desire is not first and foremost to document, rather than to, in fact, be inspired by.

Consequently, *Avalanche* holds a dense amount of field recordings which are not immediately recognisable due to a number of writing techniques, of which superposition might be a most important one. In the next section, we will look at the integration of such field recordings in the music and how their original manifestation becomes altered within *Avalanche*.

## 7.3 Stylistic approach

Environmental sound sources are the main material used for the composition of this piece. Whilst it is designed to include percussion as part of the composition, the greater form of this work is built upon a vast diversity of field recordings. In this instance, I have decided to explore the æsthetic effects of an overwhelming amount of sound sources first heard at the same time, then successively.

The effect resulting from this approach may well be reminiscent of clutter and the over-abundance of useless objects, the accumulation of waste and the extreme overload of information made continuously available to us through the recent development of technology. Ironically, whilst the aim of this piece was not to claim any form of affiliation with acoustic ecology or soundscape work, it uses noise pollution as a musical device to create information overload and may therefore ultimately carry a political message. This said, as the object of this

work is not to dwell on political issues rather than explore the poetics of a surrounding reality, I will focus on the stylistic construction of the music.

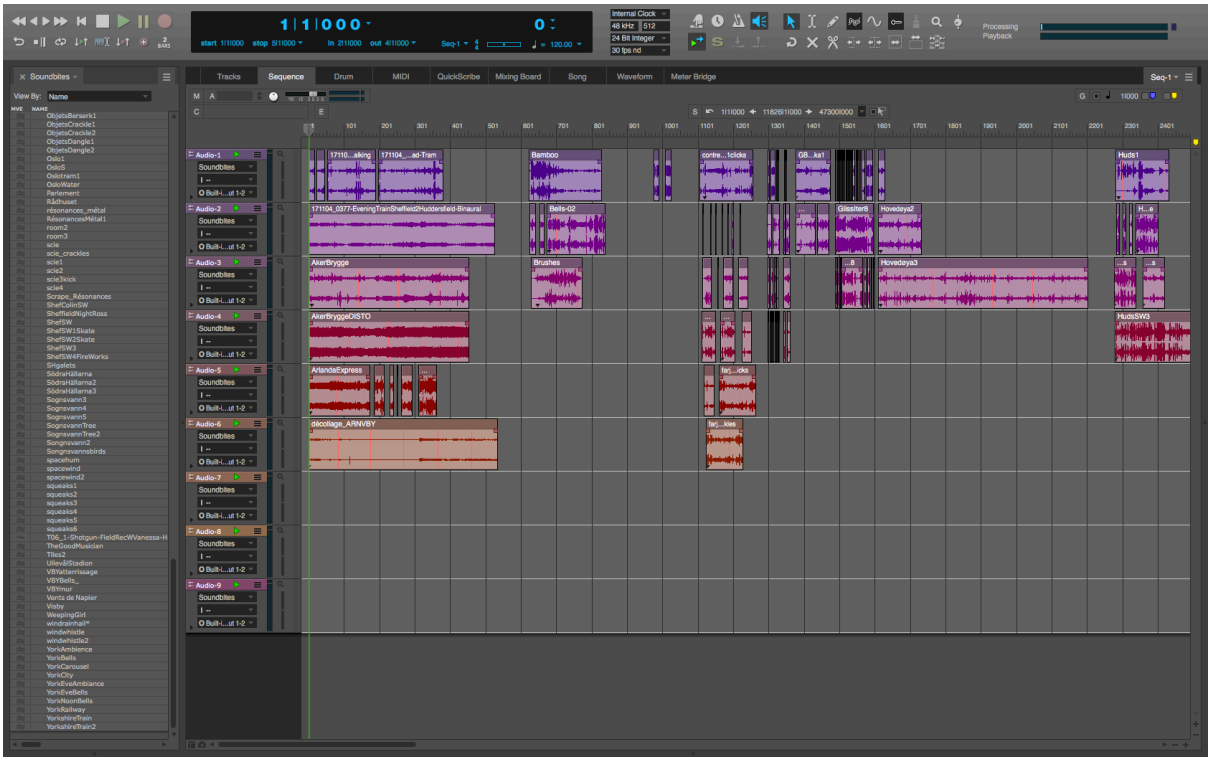

Figure 1 : first strands in *Avalanche*

The piece started out as six separate tracks in which there were different recordings of environments (Oslo city centre, a tram, Stockholm train, an aeroplane taking off, and trains between Sheffield and Huddersfield). These were the first six strands which I started building from, having selected them from my initial sound bank and grouped them for their sonic similarities. Those similarities were mainly caused by the sonic environment being affected by the passing of transportation vehicles. Consequently, they all contained loud mechanical devices creating repetitive, complex sounds, alongside a complex environment, often with many human voices and activity at different distances from the recording point, and in varying spaces, with ever-evolving environments.

I multiplied those strands, creating slightly different materials by processing them more or less heavily. For instance, many of those original sounds were duplicated and distorted. When

a significantly dense mesh of sound was starting to emerge from these multi-layered strands, I then added sound materials from even more sources.

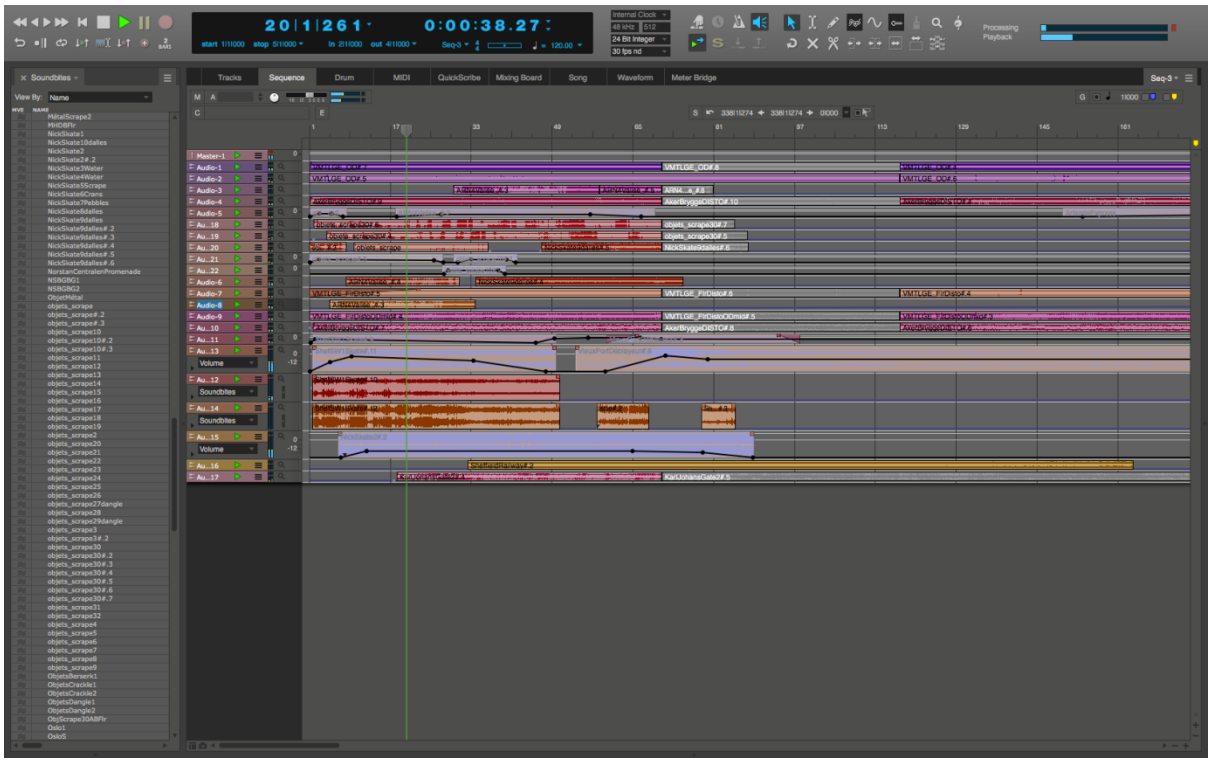

Figure 2 : thickened strands in *Avalanche*

These sources were mostly taken from other field recordings, but often consisted of isolated sound objects. I added those sounds mainly for their dynamic qualities, in a condensed manner, so as to create a nervous writing style within the already spectrally heavily loaded strands. Therefore, instead of being readily recognisable, these more precise sound objects contribute to even more broadening of the general sound energy exposed in the introduction, creating a complexity so dense that it masks most of the information that it contains. This densely composed moment is what constituted the introduction.

This introduction was then put in contrast twice (segments 'Intro 1 and 2') with recordings of

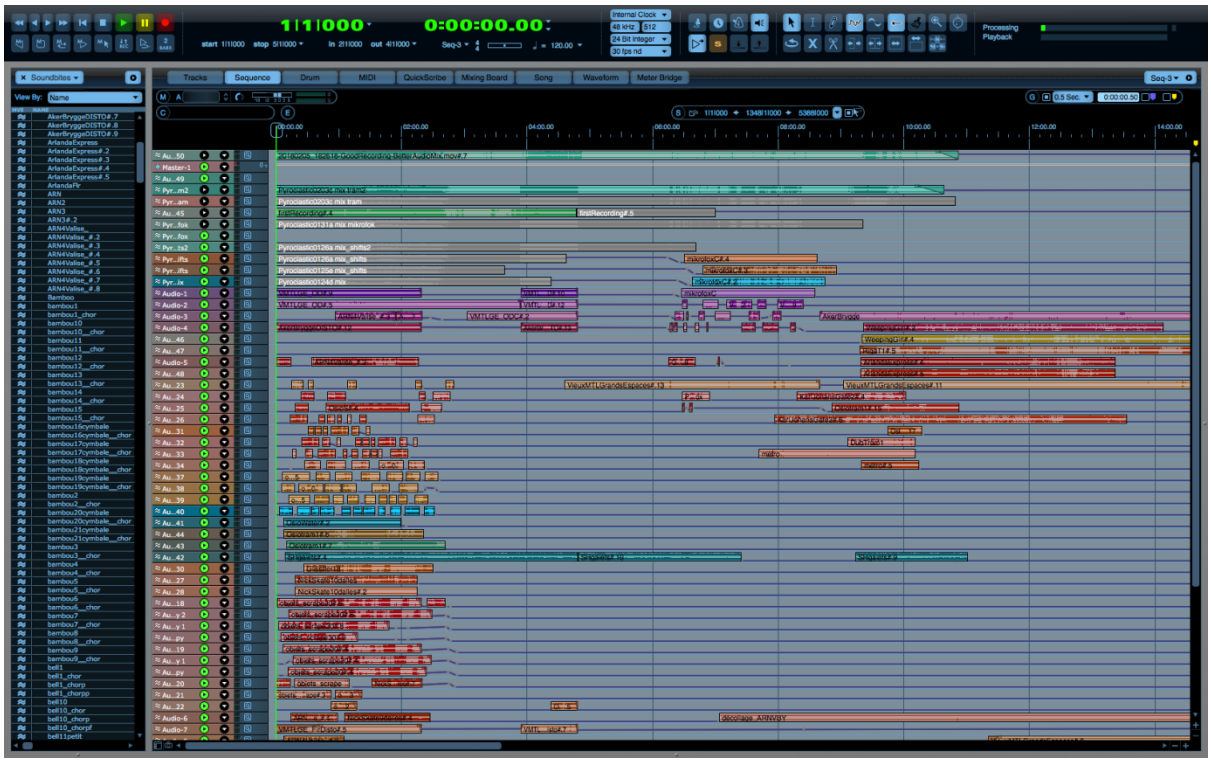

**Figure 3 : nervous writing with individual sounds in *Avalanche***

a soundwalk in an open place. The second time, at 4'48, after three minutes of highly dense introduction materials, a stark contrast occurs when the intensity drops drastically. Indeed, after such a dense moment, the quiet, open space (i.e. much less charged aural spectrum) exposed, almost creates relief for the listener. This was deliberate; as I had the image of an avalanche in mind, I wanted to loosely follow the energy profile of an abrupt, quick and violent, uncontrollable snowfall which ends in silence. Relevantly, the quieter soundwalk exposed at 4'48 was recorded in deep snow, echoing the metaphoric environment of this avalanche.

Another manifestation of this 'avalanche of information' is its constant stride forward, throughout the seven *tableaux* which follow the initial opening and successively follow each other without clearly dividing formal events. A little like following the stretched agogic profile of a snowfall, this journey through the different *tableaux* is fluid until the end, never really slowing down.

Rhythmical patterns are also present throughout and whilst this is not directly inspired by the idea of avalanche, it is a technique that I often use. It signifies a somewhat unstoppable movement forward, reminiscent of a steady train, heavy machinery which has a constant, fast-paced tempo through many different environments. In effect, these rhythms start to manifest at 10'44 and go on to remain constant until the very end of the piece. No matter how faint they appear in the general mix, they are always present, keeping a constant train-like motion (repetitive and rapid, mostly regular pulsating rhythms). This creates a breathlessness which I associate with the uncontrollable force of an avalanche's snowfall. There is also a constant renewal of information, which echoes the overload of information caused by our current technological environment.

Having had a look at the piece's formal structure and its stylistic writing techniques, I will now look at another dimension of this particular piece: the instrument. This adds another entire layer of complexity to the musical contents, and we shall further observe and explain my compositional choices in the following section.

## 7.4 Participation of the Live Instrument: Open Form Approach

Pousseur suggests that the electroacoustic means of composing affords a greater amount of conscious freedom of interpretation[71] (both on the execution, i.e. performer and receiving end, i.e. listener). Whilst I do consider that electroacoustic music provides a certain amount of intellectual liberation and, at the very least, an impression of infinite possibilities, I would not suggest that instrumental music is somehow limited. This said, as electroacoustic music is a fairly new medium which therefore more likely causes innovative creative thought, I believe that the writing techniques created and discovered with this new medium inevitably extends the spectrum of composition and interpretation possibilities. In light of these thoughts, I decided to approach the participation of the live instrumentalist in a comparable way to which I approached the electroacoustic writing of *Avalanche*. Therefore, similarly to how I realised *Omega 3* and *Exercitium arithmeticæ occultum nescientis se numerare animi*, the writing process has been that of the *concrete* approach, where recordings of the instrument have been used within the fixed media part, and later re-identified as elements for an eventual score. In the case of percussion, however, instrumental possibilities are considerably more variable than when working with accordion or with a saxophone quartet. Consequently, the approach for this piece was to collect objects for an *instrument bank* in the same way that sounds were collected for a *sound bank*. What started out with multiple field recordings also started out

Figure 4 : example setup for the performance of *Avalanche*

[71] Pousseur, H., 1960. Vers un nouvel univers sonore. Esprit, Nouvelle série, (280 (1)), pp.52–64. Available at: http://www.jstor.org/stable/24255059. Accessed 26 May 2018.

with multiple playable found objects. The idea of open form became relevant with the presence of changeable or replaceable everyday found-objects.

Still following the idea of information overflow, these non-traditional objects constitute a large part of the instrumentation of this piece. Not only are they very active and most clearly identifiable in the *tableaux*, they can also become soloists (for instance the tiles objects have two minutes dedicated to them) alongside traditional percussion instruments like cymbals. Additionally, the piece invites the performer to add found objects, particularly those considered of low value, representing scrap and trash, to create clutter around the performance space. I consider this to be of importance because it gives materiality to the environment that is represented. Just like with a site-specific work like *Omega 3*, the performance space is also an environment and if it can be taken into consideration, it may very well support the expression of the piece. About the physical space in which the performance is set to occur, here are some words by Kent Olofsson, from his thesis, discussing compositional methods collaborating with theatrical elements:

> We have referred to this as shared physical space. This is one approach of framing the work and many artistic questions for a work can start out from here. How do we integrate the space in the work? […] What viewpoints will the audience have and how will the relation be between performers and audience in the space?[72]

Whist all those questions cannot be exhaustively resolved in this context, they remain relevant; with *Avalanche*, however, my aim is not to compose music for theatre, although it does incorporate theatrical elements. This particular piece, with its complex instrumental setup and therefore requirements of rapid movements by the instrumentalist, causes the performance to have some theatricality. This theatricality is directly affected by the performance space, as suggested and discussed by Olofsson.

The score turned out to be contained in a considerably minimalistic presentation, mostly to help the performer who already has to deal with a lot of information. Indeed, as much as this piece is about an overflow of information, I felt that the amount of information already contained in the fixed sounds and the eclectic nature of the instrumentation would suffice to establish complexity. In this case, since Colin is probably more comfortable with improvisation, I thought it would be a good opportunity to leave some freedom for interpretation. Accordingly, I designed a score that outlines main segments and provides a main instrument of focus with broad instructions such as 'slowly fade in', 'sparse', 'dense' and so on. Initially, I wanted for the performer to play from the very start, but this turned out to be rather overwhelming, given the complex spectrum heard in the introduction. After several tests, I decided that the fixed sound introduction would be heard by itself and that the performer would come in by 2'35. This, in fact, creates a build-up from fixed media to live sounds. It also arguably keeps the energy up, as past the initial three to four minutes, the intensity cannot be kept up in solely the fixed sound part without the piece beginning to sound monolithic.

In this instance, unlike *Omega 3* or *Exercitium arithmeticæ occultum nescientis se numerare animi*, the performative aspect turned out to be more complicated than what was encoded in the fixed media part. By this, I mean that even if the live part is designed to follow pre-recorded

[72] Olofsson, K. Composing the Performance : An exploration of musical compositions as a dramaturgical strategy in contemporary intermedial theatre, Lunds Universitet, Malmö, 2018, p. 199.

sound objects that were placed in the fixed media part, the complexity of the performance environment make it difficult to export through only fixed media. This problem was not encountered with the two aforementioned pieces; the particularity of *Avalanche* is that it also suggests a changeable instrumentation, which affects the musical text. Indeed, the information overflow is read in a different manner when the live performer is not present.

### 7.5 Conclusion

In this chapter, we have observed how a multiplicity of environments creates an overflow of information, and how these environments cohabited in one mixed music piece. Built upon a multitude of field recordings and encoded original environments, it also uses stylistic techniques to create density and relentlessness. The presence of a live performer with an ever-evolving instrumentation also adds to the complexity of environments heard both within and around the piece at the moment of performance.

In the last section, we have seen that the environment in which a piece may be presented will affect performance and, consequently, the musical environment which is communicated. Whilst here, the discussed level of environment was mostly relating to the instrumental set-up, the question of performance environment is of course greatly relevant in the context of presenting electroacoustic or acousmatic music. In the next and last chapter, I will briefly examine the performance environments of the pieces presented in this portfolio and suggest questions for further research and composition linking performance environments and composition environments.

## 8. Conclusions and Further Questions on Environment & Performance

We have now examined each of the pieces submitted in this portfolio. Whilst every work uses environmental starting points such as recordings or cultural contexts, they also each present very unique manifestations of environments within the shared media of electroacoustic music. In the light of this compositional exploration, I wish to examine one further occurrence of environment: performance. It was briefly explored in certain chapters, such as *Omega 3*, *Border Crossing* and *Avalanche*, but I think it important to at least include an overview of performance as a component of environment and consider how this may differ from piece to piece.

### 8.1 Different Types of Performance for Different Contexts

#### 8.1.1 Éclats de Feux & Résistance: the Typical Acousmatic Environment

*Éclats de Feux* and *Résistance* are two acousmatic pieces, and this might suggest that they call for a similar performance environment or context. The typical acousmatic performance environment involves a relatively large hall with a high ceiling in which at least twenty loudspeakers are set up to allow the performance of the music to use the room with the most detailed gestures possible. Ideally, the loudspeakers represent different musical layers and are used to portray varying levels of space and environment. For instance, in the case of stereophonic pieces like *Éclats de Feux* and *Résistance*, the mapping would most likely be in pairs. Consequently, the concert hall could be divided at its centre and hold left and right channels on either side. A main pair could be situated close to the centre, and close to the

public, in which more intimate effects could be achieved. These effects could create contrasting solos; a useful performance tool in the case of *Résistance*, for instance, where human voice is a frequent element of text. In such a case, the voice could be highlighted in a solo pair. Given the availability of ceiling loudspeakers, allowing for the presentation of farther-sounding environments or less intimate sounds, we could imagine the sounds of fireworks in *Éclats de Feux* being mapped accordingly, creating an effect of exaggerated space and highlighting the considerably large environments depicted in such a piece. Of course, those are merely examples of the many possible configurations of environments possible to recreate with performance. There would also be performance decisions, to be studied and produced in accordance with the performance environment whilst still having some regard for the musical text.

It may happen that these electroacoustic works are not presented in typical acousmatic concert halls, and this will have implications for performance. For instance, one may imagine how *Éclats de Feux* would be presented completely differently by the listener if it were performed outdoors. Physical and cultural environments would arguably interact more with the piece during its performance in that way than in an acousmatic setting. The musical text would be understood quite differently, partly from the actual space it would occupy (since an outdoor scene can rarely be acoustically controlled) and partly from its place in the cultural context (there would certainly arise questions of appropriateness, unexpectedness, and even accessibility, and by extension, privilege). Is there a designated audience for *Éclats de Feux*, or may one trust that electroacoustic music is permitted to exist outside of acousmatic music halls? In a similar line of thought, given that *Résistance* deals with ideas of memories, archives and nostalgia, themes that are strongly present in the world of museums, would it also have a place there? How, then, would it interact with cultural environment? There certainly would be advantages and disadvantages to such unconventional performance settings. Possibly the most obvious problem created is that the original format was not designed with those environments in mind. Therefore, not only is there a technical requirement in order to appropriately render the content of the music, but it also supposes that the audience has an interest in that very specific genre of music. In an unconventional performance setting, such as outdoors, *Éclats de Feux* might not be received with the same appreciation than in a typical acousmatic performance setting. In a museum, perhaps, *Résistance* would likely be performed in a loop, in a listening hall where people may come and go: there might arise questions of text continuity and readability, and a completely different interaction with cultural environment, albeit still institutional[73]. How should one deal with such circumstances? Is every new environment possible to anticipate? Should it even be a concern? Those are all questions worth exploring in further research projects. This said, some atypical experiences have been explored in pieces like *Omega 3* and *Border Crossing*.

### 8.1.2 Omega 3: Site-Specific Environment

Even though *Omega 3* was largely composed like an acousmatic piece, the context of its production involved a performance in a rather unlikely location; an ancient linseed sorting

[73] Here, I consider museums as institutional (and having an institutional culture), in the same way that acousmatic music lives in an institutional environment and culture (mostly academic and research areas). In both cases, questions of accessibility and privilege, and even of value for the artistic object itself, arise on different levels, which inextricably influence the audience's reaction and its relation to the proposed work.

factory. At that location, the typical acousmatic setup was neither possible, nor ideal. The environment of that specific performance was obviously not designed for acousmatic performances. If the original performance would have been intended to be acousmatic, I might have had little control over performance options; a limited number of loudspeakers limiting my use of the space, as well as this setup being too small in proportion to the size of the room. We did make use of the high structure. As it happened to be accompanied by a live accordion performance, the space was used in quite a flexible way; the accordionist agreed to climb to the top level of the structure and play from there. I used the available sound setup on the ground floor, where I was able to produce general diffusion gestures and patterns following the musical text. During the performance, Tuulikki and I also reacted to the environment and to each other's contributions within this environment. As I heard her sound, I was able to guide the music in the space, and vice versa. As it turns out, this is a specific example of a specific performance in a predetermined environment. Of course, *Omega 3* being dependent on that environment, it became a site-specific work, although now exportable to a context of typical acousmatic performance. However, the question remains: is the experience altered, and does the absence of the original environment hinder the original intent in *Omega 3* (which was to have a live interaction with improvised accordion)? I personally believe that environments are constantly evolving and that works of art therefore must have some degree of flexibility in their manifestations if they are not to be completely ephemeral. I would understand that the performance of *Omega 3* in a typical concert hall is not the same experience as that of the original performance in the linseed sorting factory in the small town of Mooste, Estonia. This said, at least from my perspective, it certainly would not be enough to declare it a new piece, or at least a different version of the piece on account of its transformed content. Furthermore, there could be some issues of privilege, exclusion and accessibility related to the understanding that a piece like *Omega 3* could not be fully experienced in another way than in that particular linseed sorting factory, somewhere in the Baltic states, near the intersection of Latvia and Russia. Moreover, my intention as a composer was not to make this piece restricted to a certain public at a certain point in time. That is also why I have revisited the piece and made sure its updated version was exportable.

### 8.1.3 Border Crossing: A Gaming Experience

*Border Crossing* has a very peculiar production context and its performance environment is also highly specific. Similarly to *Omega 3*, its primary environment is site-specific. In this instance, specificity was not generated by the fact that I was present to produce the piece in the original environment nor that the sound materials have anything to do with that particular physical environment. However, in this case, as earlier discussed, performance environment is constructed, and this affects the overall experience of this piece. Of course, there is also the presence of a narrow and dark performance environment[74], but the main influencing factor in this case is really the gaming environment. As an example, *Éclats de Feux* and *Résistance* both could be performed on a stereo sound system in a narrow and dark performance space without their musical text being distorted. However, *Border Crossing* will be read in a different manner in the context of the LARP for which it was designed. Its narrative might be less important in another context, although it retains many of its narrative cues, such as the opening and closing of van doors represented by the referential sound objects. Extracted from that LARP, *Border*

[74] The darkness and narrowness of that space have an impact, but it is not as strong as the nature of the gaming environment itself.

*Crossing* is still valuable as a piece of electroacoustic music and was even performed as such for the occasion of the *Composer / Computer / Distance* conference held in Sheffield in May 2018[75]. Whilst the context was not that of a gaming experience, the piece still had potential for æsthetical reception.

### 8.1.4 An Almost Abstract Experience: The Case of Multi-Channel Surround Sound

Much like the previous pieces, *An Almost Abstract Experience* is acousmatic. Its main particularity is the use of the 5.1 format. Similarly to the performance environment described in the section about *Éclats de Feux* and *Résistance*, I believe a traditional acousmatic performance environment would be suitable for *An Almost Abstract Experience*. The configuration would need to be adapted for 5.1, but this would not require an especially complicated redesign; the hall could remain split between left and right, as 5.1. is also based on that type of placement. It is more precise in that it considers a front and a back environment, but this is not contradicting the typical acousmatic performance environment, in which the audience is generally facing one way. Therefore, in order to accurately represent 5.1. in a traditional space, there would only need to be a single loudspeaker added in the front of the concert space for the centre solo. Obviously, this centre voice can also be replicated in the different levels of the room, just as stereo pairs would be multiplied throughout the hall in a typical acousmatic setup. Such an acousmatic setup can also accommodate mixed media pieces like *Exercitium arithmeticæ occultum nescientis se numerare animi* and *Avalanche*.

### 8.1.5 Exercitium arithmeticæ occultum nescientis se numerare animi: With or Without Instrumentalists

Just as I had reflections on the exportability of site-specific works such as *Omega 3* and *Border Crossing*, the context of *Exercitium arithmeticæ occultum nescientis se numerare animi* caused me to ponder possible modes of performance. In this case, the encoded musical environment was composed entirely from recordings of the instruments which were going to be used live during the performance. This made easier the process of scoring the piece, which at first was only through the presence of audio elements in the fixed media part. As the musical content was entirely contained in the original composition, there is here the choice of performing the piece with or without the live instrumentalists. In the case of the instrumentalists being absent from the performance, a typical acousmatic setup is sufficient, as this essentially becomes a stereo acousmatic piece. In the presence of the instrumentalists, there would be a need to have a consciousness of the space and of the balance between the sound produced live from the instruments and the one produced by the sound system throughout the hall. In this sense, the performance environment might need to be calibrated, mostly by adjusting the sound system, to be consistent with the instrumentalists in order to not distort the originally intended musical text. Furthermore, the instrumentalists in this piece can be fairly transparent as they do not have very theatrical or scenic implications, unlike *Avalanche*, the last piece of this portfolio.

### 8.1.6 Avalanche : Multiplicity and Excess of Environments

As previously discussed, *Avalanche* encompasses a multiplicity of environments at a number of different levels. Like *Exercitium arithmeticæ occultum nescientis se numerare animi*, *Avalanche* uses the presence of a live instrumentalist. However, it is not conceived to be

[75] Composer / Computer / Distance., (©2018). *Composer / Computer Distance.* [Viewed 5 October 2018]. Available from : http:// http://ccdconference.co.uk

independent from its instrumentalist, since this instrumentalist portrays, with their instrumental sculpture and their theatrical interpretation of the piece, the overabundance of information and this very multiplicity of environments referred to earlier. Whilst a typical acousmatic performance environment would suffice for the fixed media part of this piece, there would be a need for careful consideration of the space given to the live instrumentalist, as they would become a point of focus. In this instance, not only would there be a need for balance between the sound system and the instruments, but also, as it becomes rather visual, a need to calibrate the performance environment to support the focus toward the instrumentalist. This might prove challenging, as the fixed media part is very charged, and it could be tempting to devise an equally charged performance in the space of the concert hall. Such a charged interpretation might hinder the expressivity of the live instrumentalist. Then again, a critical question might be asked: if the ultimate theme explored by *Avalanche* is excess of information, then would it not be natural to create excess of information at every level of its performance and environment? I would argue that this is something that might be explored. Designing, rethinking, exploring and making use of the performance environment is likely the final step for the realisation of the pieces proposed in this composition portfolio. What comes next? During the composition of these pieces, many elements of information and questions arose that I would like to explore in further research and composition projects.

## 8.2 Conclusion & Concepts to Further Explore

Within this thesis, I have explored how several different occurrences of environment manifest in and around my works of electroacoustic music. I have made a distinction between physical and cultural environments, and argued that whilst they are not separate from one another, they create a multiplicity of different surroundings which can be studied with different parameters (such as internal and external space, site-specificity, poiesis and narrativity, the role of applied music, the interactions between such environments, and the possibility for the work to be a commentary on its own materiality and era, to name a few[76]).

Physical environments tend to be more easily identifiable than cultural environments, because they are tangible. They are therefore easier to map and to write about. This might explain, amongst other reasons, why soundscape is so well-known. On the contrary, cultural environments are malleable and fluid, and therefore extremely difficult to define in a precise manner. Even so, I have interest in the notion of phonoculture[77] as an inspiring way of thinking for me, which can be linked with the compositional approach used for *Éclats de Feux*. I believe that this notion could be further developed, and, like Savouret has suggested, be integrated in pieces which involve a community from start to finish. In other words, I am interested in involving the audience in the very process of composition. I believe that there would be

[76] Taking into consideration the very infinite possibilities of dimensions surrounding such a multiplicity of environments revolving around the physical and cultural (which is, as we have seen, ever-evolving and dynamic), I cannot expect that it might be remotely possible to come up with an exhaustive list of parameters to encompass them.

[77] Concept developed by Alain Savouret, according to which one, as a composer, may connect with communities on a much more personal level if they are inspired by objects which are recognisable and meaningful to the audience who receives the piece. In the article *Électroacoustique et perspective phonoculturelle*, he gives the example of using the sound of a machine in an ancient factory. For regular sound enthusiasts, it may produce an interesting sound, and just that. In the case of locals, who might have spent half of their life near that machinery and around that factory, they might break out in tears from such a personal connection. Taken from: Savouret, A. (2014). Électroacoustique et perspective phonoculturelle. *Circuit: Musiques contemporaintes, 13*(1), 9-13.

opportunity for not only collaboration, but access to shared knowledge and the understanding of multiple and diverse cultural environments, simply by including said audience in the process of creation. Some (like Yves Daoust or Jean-François Blouin)[78] have started to do it within the field of electroacoustic music, but very few writings document this approach. Similarly, the experience of composition for LARP inspires me to look further and to explore possibilities of investigation within the field of cultural environment in electroacoustic music. Exploring new contexts such as scenography and eclectic performances where audience and composer interact and inform each other seems like a promising avenue for the further investigation of cultural environment in electroacoustic music, as well as a novel way to disseminate knowledge on the subject.

[78] I should like to add that there exists a very similar approach in the film industry, in which Wapikoni Mobile, an organisation which has the purpose of providing social support to the First Nations of Canada (particularly in the province of Québec), has designed mobile studios with the aim of making them available to the youth in Aboriginal communities, and to invite these people to produce their own works of art. Of course, this is more social work than artistic work, but addresses very close issues, which I am interested in exploring.

# Annex

## Programme Notes

### 1. Éclats de Feux

Transitional work of my journey in composition, *Éclats de Feux* started with many sound recordings of objects and spaces found around Sheffield. As the first piece of my doctoral portfolio, this one acts as a bridge between the school of Montréal, where I come from, and the effervescence of British acousmatic. In this piece, I explored the contrasts between powerful masses and up-close solo objects, with particular sensitivity to the use of space in stereophony, as my research is focused on the interpretation and performance of acousmatic music. The title refers to the impressive bonfire nights and endless fireworks I have been exposed to in the first weeks after my arrival in the UK. "*Shards of Fire*", as it translates, also represents the extreme rapidity and intensity with which one's life may be completely changed with one single voyage.

### 2. Omega 3

Composed at an ancient linseed sorting factory during an artistic residency in the small town of Mooste, in Estonia, this piece explores themes of derelict spaces, cultural environments and traditional music techniques. It started as a collaboration with Tuulikki Bartosik, Estonian traditional folkloric musician, who uses various local Baltic techniques in her performance style. Originally intended as a live performance, it was revisited to take the shape of a standalone fixed media piece. In it, we hear sounds of local Estonia, synthetically generated material, and traditionally Nordic musical sonorities.

### 3. An Almost Abstract Experience

Finding balance and focusing on the very limit between what holds us together and what tips us over: this may well be how music comes to be. Where this piece abounds with surreal worlds inspired by the deepest invisible energy streams, it is also made of very real, concrete sound sources. By its fluid nature it therefore becomes an almost abstract experience. Composed at Visby Tonsättarcentrum, EMS i Stockholm and USSS Sheffield.

### 4. Exercitium arithmetic occultum nascientis se numerare animi

Composed between Stockholm, Sheffield and Gothenburg in 2017, this piece is exclusively based on sounds generously offered by the Stockholm Saxophone Quartet. The title of this piece translates as: "an unconscious exercise in arithmetic in which the mind does not know it is counting". This, to me, evokes a reality, especially manifest through electroacoustic music, that I have always found fascinating: the idea that music is only really manifested as music through the format of sound, even though one may be able to conceive of it as an idea. With the acousmatic experience, not only does the music need to be written (or encoded) in order to be perceived, it can only be done in real-time.

### 5. Border Crossing

Composed for The Quota, a live role-play experience, in December 2017, this stereo acousmatic piece is designed to evoke a metaphorical and imaginary environment more than a purely acoustic one. This LARP (Live Action Role-Play) situates the participants, which constitute the original audience for this piece, in the context of embodying the journey of a refugee, leaving

their country with urgency, in a desperate attempt to reach a safer land. Composed during an Erasmus+ Placement at EMS studios (Stockholm).

### 6. Avalanche

Composed amassing a wide array of 'noisy' sounds (field recordings, objects in open spaces, objects considered to be junk), this piece explores multiplicity and excess of information. After the initial collection of field recordings, a generation of processed sound was added to the already very large sound bank which coloured this piece. Designed to be flexible for its performance setup (live with a non-fixed percussion instrumentation and fixed media or solo fixed media), it also considers questions of variability of information and multiplicity of performance spaces and environments. It is designed to be crude and æsthetically harsh by its loaded form and insistent use of sound processes such as distortion and filtering. With *Avalanche*, I wanted to see where was the limit between æsthetic and conceptual.

### 7. Résistance

A witness of its era, *Résistance* brings together improbable stories: the recounting of my grandmother's memories of the French Résistance and having danced with Django Reinhardt, and the realities of 2018's recording media, with its readily available technologies within our smartphones, and the professional studio at EMS in Stockholm, recording multichannel Buchla sounds. Poetically, they join as a commentary on the passing of time and history, with a layer of processed accordion sounds, which bridge the human experience with the perspective of a colder, machine-induced system.

## List of Performances

### 1. Éclats de Feux

14.05.2016 / Sound Junction, Sheffield, University of Sheffield, PREMIERE
19.05.2016 / Audiovisual Arts Festival, Corfu, Ionian Academy
28.05.2016 / Música Viva, Lisbon, O'culto da Ajuda
15.09.2016 / Class Seminar, Montréal, Concordia
12.10.2016 / Electric Sense, Toronto, CIUT
27.10.2016 / EMUFest, Rome, Conservatorio Santa Cecilia
12.11.2016 / NWEAMO Festival, Tokyo, JSSA
21.11.2016 / Acoustic Frontiers, Ottawa, CKCU
08.12.2016 / Foldover, Oberlin Ohio, WOBC
19.12.2016 / Emisión JTTP, Madrid, UNDÆ!
15.03.2017 / InTIME, Coventry, Coventry University
24.03.2017 / JTTP Winners, Vancouver, Boca del Lupo
24.03.2017 / JTTP Broadcast, Winnipeg, UMFM Radio
07.04.2017 / Del otro lado del muro, Morelia, CMMAS
15.04.2017 / GroundSwell Radio, Winnipeg
01.05.2017 / Perdidos en el Espacio, Stantiago de Chile, Radio Universidad
10.06.2017 / NØ Bounds Festival, Sheffield, Trafalgar Warehouse
12.08.2017 / ZKM_Kubus, Karlsruhe
29.08.2018 / UNM Festival, Bergen, Østre

### 2. Omega 3

02.07.2016 / Omega 3 Art Exhibition Opening, Mooste, MoKS, PREMIERE

### 3. An Almost Abstract Experience

21.01.2017 / FRST Festival, Visby, Gotlandsmuseum, PREMIERE
23.03.2017 / Sattelite Sound Junction, Sheffield, DINA Venue
06.05.2017 / Sound Junction, Sheffield, University of Sheffield
29.05.2017 / Ljud & Genus, Gothenburg, Atalante
15.06-14.09/2016 GuteLjaudKarte, Visby, Fleringe Kyrka

### 4. Exercitium arithmetic occultum nascientis se numerare animi

3.11.2017 / Sound Laboratory, Sheffield, University of Sheffield, PREMIERE
16.03.2019 / Svensk Musikvår, Stockholm, Konserthuset

### 5. Border Crossing

11.12.2017 / The Smoke, London, The Nursery Theatre, PREMIERE
17.03.2018 / Quota: Border Crossing, Lund, Knutpunkt
24.05.2018 / The Quota LARP, Leicester

### 6. Avalanche

22.06.2018 / Finding The Abyss: Colin Frank, Huddersfield, Phipps Hall, PREMIERE

### 7. Résistance

21.04.2018 / Stockholms Kulturnatt, Stockholm, Fylkingen, PREMIERE
29.05.2018 / Eurofolk Festival, Moscow, Ostankino Tower
02.11.2018 / Sound Junction, Sheffield, University of Sheffield

## Bibliography


Andean, J. (2017). Space and Place in Electroacoustic Music. In J. B. al., *Music, Memory and Space* (pp. 171-172). Turku: Intellect Books.

Bachelard, G. (1957). *Poétique de l'espace.* Paris: Presses Universitaires de France.

Barrett, N. (2002). Spatio-musical composition strategies. *Organised Sound, 7*(3), 314-315.

Bédard, M. (2011). *Du langage cinématographique à la musique acousmatique / Écriture et structures.* Montréal: Université de Montréal.

Bregman, A. S. (1978). Auditory Streaming: Competition among alternative organizations. *Perception & Psychophysics, 3*(5), 391-198.

Casey, E. S. (1996). How to get from Space to Place in a Fairly Short Stretch of Time: Phenomenological Prolegomena. (S. F. Basso, Ed.) *Senses of Place*, 13-52.

Caux, J. (2012). *Almost Nothing With Luc Ferrari.* Berlin: Errant Bodies Press.

Chion, M. (1982). *La musique électroacoustique.* Paris: Presses univeristaires de France.

Chion, M. (1983). *Guide des objets sonores.* Paris: Buchet/Chastel.

Chion, M. (1988). Les deux espaces de la musique concrète. *Musiques et recherches, 1*.

Dalhaus, Carl et al. (2009, 12 11). *Harmony.* Retrieved from Grove Music Online: http://www.oxfordmusiconline.com/subscriber/article/grove/music/50818

De Rivera, J. (1992). Emotional Climate: Social Structure and Emotional Dynamics. *International Review of Studies on Emotion*(2), 197-218.

Dyrssen, C. (2007). Are we still pretending that spaces are boxes? In A. R. Persson (Ed.), *LARM: From mouth cavity to laptop: the sound of Nordic cart* (p. 275). Stockholm: Kabusa Böcker.

Ferrari, L. (n.d.). *Artistes: Luc Ferrari*. Retrieved 10 22, 2017, from Électrocd: https://www.electrocd.com/fr/artiste/ferrari_lu/Luc_Ferrari

Harrison, J. (1996). *Évidence matérielle: Jonty Harrison.* Retrieved 03 10, 2017, from Électrocd: http://www.electrocd.com/en/cat/imed_0052/

Henriksen, F. (2002). *Space in Electroacoustic Music: Composition, Performance and Perception of Musical Space.* London: City University.

Huxley, A. (1931). *Music at Night.* London: Chatto & Windus.

Krapow, A. (1996). Happenings in the New York Scene. (J. Kelley, Ed.) *Essays on the Blurring of Art and Life*, 18.

Krause, B. (2008, January/February). Anatomy of the Soundscape: Evolving Perspectives. *Journal of the Audio Engineering Society,* 56(1/2), 73-80.

LaBelle, B. (2015). *Background Noise* (2nd Edition ed.). Bloomsbury: Bloomsbury Publishing.

McAdams, S. (1997). L'organisation perceptive de l'environnement sonore. *Rencontres IPSEN en ORL*.

Merlier, B. (2006). *Vocabulaire de l'espace en musiques électroacoustiques.* Le Vallier, France: Delatour France.

Naylor, S. (2014). Appropriation, Culture and Meaning in Electroacoustic Music: A composer's perspective. *Organised Sound*, 112.

Norman, K. (2012). Listening Together, Making Place. *Organised Sound,* 17(3), 257-265.

Olofsson, K. (2018). *Composing the Performance: An exploration of musical compositions as dramartugical strategy in contemporary intermedial theatre.* Malmö: Lunds Univeristet.

Pires, I. (2007). *La notion d'Espace dans la création musicale: idées, concepts et attributions.* Paris: Université Paris 8.

Pousseur, H. (1960, January). Vers un nouvel univers sonore. *Esprit, Nouvelle série, 280*(1), 52-64.

Rüütel, I. (n.d.). *Kannel.* (O. U. Press, Ed.) Retrieved 10 17, 2017, from Grove Music Online: http://www.oxfordmusiconline.com/subscriber/article/grove/music/L2232552

Rasula, J. (2016). *History of a Shiver: The Sublime Impudence of Modernism.* Oxford University Press.

Risset, J.-C. (1988, March). Perception, environnement, musiques / Musique et Perception. *InHarmoniques*(3).

Rodaway, P. (1994). *Sensuous Geographies.* London and New York: Routledge.

Rosenberg, S. (2014). Kulning – an ornamentation of the surrounding emptiness: about the unique Scandinavian herding calls. (R. U. Music, Ed.) *Voice and Speech Review, 8*(1), 100-105.

Roy, S. (2003). *L'Analyse des musiques électroacoustiques: Modèles et propositions.* Paris: Éditions l'Harmattan.

Savouret, A. (2014). Électroacoustique et perspective phonoculturelle. *Circuit: Musiques contemporaintes,* 13(1), 9-13.

Schaeffer, P. (1966). *Traité des objets musicaux* (1977 ed.). Paris: Seuil.

Schaeffer, P. (1996, Summer). Pierre Schaeffer, 1910-1955: The Founder of Musique Concrète. (J. d. Reydellet, Ed.) *Computer Music Journal,* 20(2), 10-11.

Schafer, R. M. (1993). *The Soundscape: Our Sonic Environment and the Tuning of the World.* Rochester: Inner Traditions / Bear & Co.

Smalley, D. (1994). Defining Timbre, Redefining Timbre. *Contemporary Music review, 10*(2).

Smalley, D. (1997). Spectromorphology: explaining sound-shapes. *Organised Sound, 2*(2).

Smolicki, J. (2017). *Para-Archives: Rethinking Personal Archiving Practices in the Times of Capture Culture.* Malmö: Malmö University Press.

Stansbie, A. (2013). Between Plasticity and Performance: an ontological account of electroacoustic music. *Conference and the Journal of the Korea Electro-Acoustic Music Society* (p. 3). Seoul: Journal of the Korea Electro-Acoustic Music Society.

Stansbie, A. (2013). *The Acousmatic Musical Performance: An Ontological Investigation.* London: City University Press.

Trottier, D. (2005). La poïétique d'Yves Daoust: entre représentation socioculturelle et questionnement identitaire. *Circuit musiques contemporaines,* 15(2), 13-36.

Tychsen, A., Hitchens, M., Brolund, T., & Kavakli, M. (2006). Live Action Role-Playing Games: Control, Communication, Storytelling, and MMORPG Similarities. *Games and Culture*, 252-275.

Vande Gorne, A. (2017). Techniques d'écriture par montage. In A. Vande Gorne, *Traité d'écriture sur support* (pp. 1-17). Ohain: Musiques & Recherches.

Westerkamp, H. (2003). Nada—An Experience in Sound. *S:On: Sound in Contemporary Canadian Art*, 121.

Young, J. (2016). Figures of Speech: Oral History as an Agent of Form in Electroacoustic Music. *NYCEMF* (p. 14). New York: New York City Electroacoustic Music Festival.

Zelli, B. (2010). *Musique Acousmatique and Imaginary Spaces.* Retrieved October 2018, from https://econtact.ca/13_3/zelli_acousmatique.html

## Discography

Daoust, Y., (1991). *Anecdotes* [CD]. Montréal empreintes DIGITALes

Daoust, Y., (2001). *Bruits* [CD]. Montréal: empreintes DIGITALes

Daoust, Y., (1998). *Musiques Naïves* [CD]. Montréal : empreintes DIGITALes

Dhomont, F. (1989). *Cycle de l'errance: Espace / Escape.* Retrieved April 19, 2017, from Électrocd: https://www.electrocd.com/en/piste/imed_9607-1.11

Harrison, J., (2000). *Évidence Matérielle* [CD]. Montréal: empreintes DIGITALes

Parmegiani, B., (1976). *De Natura Sonorum* [CD]. Paris : Ina-GRM

Reich, S. (1988). Different Trains / Electric Counterpoint. New York: Nonesuch